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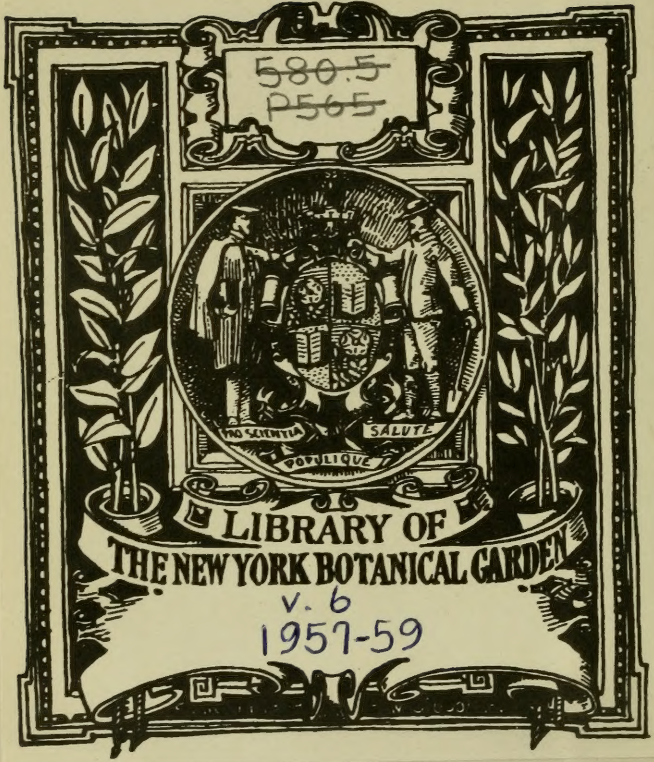

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CERTAMEN MELASTOMATACEIS V.

John J. Wurdack

Due to the press of other commitments, Dr. Gleason left unfinished his studies on the many recent Colombian *Blakeeae* collections, chiefly those of Dr. Cuatrecasas. The Pacific Coast regions of Nariño, El Valle, and the Choco are undoubtedly the New World areas richest in members of this tribe; indeed, the plethora of species seems almost unbelievable. Apart from the suite described in this paper, other apparently distinct Colombian *Blakeeae* (fruiting only) remain undetermined at New York and Chicago, awaiting recollection in flower.

Unfortunately, several of the species first collected and described by Triana and unknown to both Cogniaux and Gleason remain unrecollected, at least as far as one can discern from the original descriptions. Dr. Maguire, during a recent European trip, could not locate these collections at either Paris or the British Museum; Dr. Uribe has informed me that they are not among the Triana specimens at Bogota. These "missing links" are *Blakea quadrangularis*, *Topobea sessilifolia*, *T. glabrescens*, and *T. insignis*. Other than these four unknowns, at least type photographs have been available for the Colombian species.

It has seemed best, pending a revision, to continue Cogniaux' and Gleason's maintenance of *Blakea* and *Topobea* as separate genera. Perhaps I am more tradition-bound than Macbride who united them in the Flora of Peru; however, at least in the many specimens which I have examined critically, the anther shape has left no doubt as to the convenient (and traditional) classification.

BLAKEA HYDRAEFORMIS Wurdack, sp. nov.

B. pilosae Gleason affinis sed cum foliorum lamina basi rotundata et superficie subtus cum pilis erectis stipitato-stellatis primum densiuscule vestita, bracteis exterioribus maioribus, calycis lobis vix distinctis cum sinibus latis concavisque.

Rami superiores cum pedicellis densissime lanuginoso-pilosi (pilis gracilibus plerumque 1-2 mm. longis) et ad nodos densissime setosi (setis erectis paleaceis 10-15 mm. longis). Petioli pilosi 0.5-1.3 cm. longi; lamina integra crasse coriacea supra nitida 15-30 (acumine excluso) X 7-11 cm. ovato-oblonga apice subabrupte acuminata (acumine 1-2 cm. longo) basi rotundata, 5-nervia nervis primariis supra

impressis subtus bene elevatis nervis secundariis principalibus conspicuis ca. 2-3 mm. inter se distantibus supra anguste elevatis subtus bene elevatis cum tertiariis obscure reticulatis, supra glabra, subtus primum densiuscule setulosa (pilis stipitatis apice pauco-ramosis) in superficie tarde glabrata. Flores 6-meri 2- vel 3-fasciculati in quaque axilla; pedicelli 5-12 mm. longi; bracteae omnino liberae extus modice strigulosae intus apicem et basim versus furfuraceo-lanuginosae, exteriores 18-25 X 10-12 mm. ovatae apice acutae vel acuminatae, interiores 13 X 13.5 mm. orbiculares apice rotundatae. Hypanthium 6 (ad torum) X 6 mm. densiuscule gracili-strigulosum demum apicem versus glabratum; calycis tubus ca. 1 mm. altus, lobis remotis ca. 0.7 mm. altis extus minute tuberculatis. Petala 11 X 6.5 mm. oblonga apice rotundato-truncata inconspicue ciliolata, ciliis 0.1-0.15 mm. longis. Filamenta 7.2 mm. longa; antherae oblongae ca. 3.5 mm. crassae, thecis 4.4 mm. longis, connectivo basi non prolongato apice thecas 0.6 mm. superante, poris duobus minutis ventralibus ad apices thecarum. Stylus 6 X 1.1 mm. apicem versus attenuatus 0.5 mm. diam.; stigma truncatum 0.7 mm. diam.; ovarium glabrum 6-loculare apice conico-attenuatum cono truncato 1.6 mm. alto.

Type Collection: J. Cuatrecasas 14032 (holotype NY; isotypes F, NY), collected in forest at Puerto Merizalde, Río Naya, Pacific Coast, elev. 5-20 m., Dept. El Valle, Colombia, Feb. 22, 1943. "Gran bejuco; hoja verde claro, y más palido en el envés, cáliz id."

Paratypes (both from Río Yurumangui, Pacific Coast of El Valle, Colombia): Cuatrecasas 15879 (F), from Veneral, Jan. 28-Feb. 10, 1944; Cuatrecasas 16128 (F), from Peña de Candelario, Feb. 9, 1944.

B. pilosa has leaf bases attenuate, the lower leaf surface glabrous (the veins with fine appressed hairs), the exterior bracts only 9-10 mm. long, the calyx distinctly imbricate-lobed, and the petals larger. The specific epithet of B. hydraeformis, suggested by Dr. D. P. Rogers, refers to the hydroid hairs of the lower leaf surface.

BLAKEA MEGAPHYLLA Wurdack, sp. nov.

B. paleaceae Gl. et B. floriferae Gl. affinis, sed cum foliorum nervis secundariis creberrimis et floribus maioribus.

Caulis perfectus mihi ignotus sed evidenter robustus. Petioli ca. 15 cm. longi glabri; lamina glabra supra nitidula et densissime albido-punctulata ad margines obscure remoteque calloso-denticulata (denticulis vix 0.5 mm. altis) 35-38 X 26 cm. late ovato-elliptica apice breviter (ca. 1 cm.) abrupteque acuminata basi rotundato-truncata 11-nervia nervis primariis supra subplana subtus elevata secundariis creberrimis 0.5-1 mm. inter se distantibus supra et subtus indistincte elevatis. Flores 6-meri 5-6 in quaque axilla, nodo florifero a membrana papyrifera ca. 6-7 cm. longa subtento (membrana lacerata, perfecta ignota). Pedicelli 1.5-2 cm. longi apice sparse verrucosi; bracteae liberae concavae suborbiculares apice rotundatae cum pedicello hypanthioque tenuissime furfuraceae, exteriores 20 X 18 mm., interiores 16 X 19 mm. Hypanthium 7 (ad torum) X 8 mm. hemisphaericum; calycis tubus 0.5-0.8 mm. altus, lobis 1.1-1.5 mm. altis late orbicularibus rotundatis extus obscure unituberculatis. Petala 20 X 12-13 mm. obovata apice rotundata obscure ciliolata ciliis vix 0.1 mm. longis. Antherae cohaerentes biporosae; filamenta 9.5 mm. longa; thecae oblongae 5.5 mm. longae sub connectivum 0.5 mm. prolongae, connectivo 6.5 mm. longo apice obtuso thecas 1.5 mm. superante. Stylus 15 X 2.2 (basi)-1.3 (apice) mm. densiuscule cum glandulis clavatis ca. 0.1 mm. longis ornatus; stigma truncatum; ovarium inferum 6-loculare apice in conum liberum truncatum 3 mm. altum prolongum.

Type Collection: J. Cuatrecasas 17504 (holotype NY; isotype F), collected at Silva, Río Cajambre, Pacific Coast, elev. 5-80 m., Dept. El Valle, Colombia, May 5-15, 1944. "Arbusto epifito-trepador; ramas muy nudosas, tortuosas. Hoja grueso-coriácea, verde oscuro semi-brillante haz, verde amarillento envés. Pétalos cárdenos. Filamentos blancos. Anteras blancas con base amarilla."

Both B. paleacea and B. florifera have secondary leaf veins spaced 3-5 mm. apart and lower leaf surface veins pubescent. B. florifera has densely setose petioles and floral bracts only about 10 mm. long. B. paleacea has acuminate paleiferous bracts only about 11 mm. wide. Whether the huge nodal membrane of B. megaphylla is stipular or bracteal could not be ascertained from the available material; a similar smaller much-lacerate membrane is present in B. florifera.

BLAKEA PODAGRICA Triana ssp. CILIATA Wurdack, ssp. nov.

A ssp. typica differt floris bracteis et calycis lobis glanduloso-ciliatis.

Type Collection: J. Cuatrecasas 23976 (holotype F 1300623), collected at "hoya del río Digua, Río San Juan, abajo de Queremal a la derecha del río entre km. 52 y 53, Cordillera Occidental, vertiente occidental, 1300-1500 m.

alt., Depto. El Valle, Colombia, 27 marzo 1947." Paratype: same locality and date, *Cuatrecasas* *23867* (F).

The typical subspecies, apparently a low- (up to 450 m.) altitude analogue, has both bracts and calyx lobes glabrous except for the juvenile minute reddish puberulence characteristic of the species; the glanduliferous cilia of ssp. *ciliata* are persistent and prominent (1-1.5 mm. long). The leaf blade secondary veins of ssp. *ciliata* tend to be further apart than in the typical ssp., and the blade base more rounded. The anthers of ssp. *podagrica* seem to be slightly smaller (up to 4.2 mm. long i.s.) than the 4.5-5 mm.-long anthers of ssp. *ciliata*; unfortunately, the many collections of the typical ssp. have few complete flowers. The typical ssp. is quite variable in leaf shape and secondary vein spacing as well as in bract size.

BLAKEA STIPULACEA Wurdack, sp. nov.

B. repenti (R. & P.) Don affinis, sed cum foliis basi rotundatis non plinervibus, bracteis minoribus, calycis lobis minus distinctis cum sinibus concavis.

Rami nodosi obtuse quadrangulati primum dense setulosi (pilis crispulis gracilibus 1-2 mm. longis) demum glabrati, stipulata stipulis reniformibus 2-3.5 mm. altis ciliatis deciduis cum linea stipulacea demum conspicua. Petioli 3-4 cm. longi cum pedicellis primum supra setulosi demum glabrati; lamina subcoriacea integra 11-15 (acumine excluso) X 5.5-7.5 cm. elliptica apice breviter (5-10 mm.) gradatimque acuminata basi rotundata 5-nervis (jugo marginali neglecto) nervis secundariis supra vix conspicuis ca. 2-2.5 mm. inter se distantibus nervulis obscuris, supra primum densissime strigulosa (pilis gracilibus ad 4 mm. longis primum brunneis demum albidis) mox glabrata, subtus in nervis nervulisque sparse furfuracea in superficie cum glandulis clavatis minutis densiuscule ornata. Flores 6-meri in quaque axilla duo; pedicelli 1.5-2 cm. longi; bracteae liberae extus sparse puberulae intus densiuscule strigulosae, exteriores 10 X 9.5 mm. suborbiculares apice obtusae, interiores 10 X 7.5 mm. obovatae apice obtusae. Hypanthium ca. 5.5 mm. altum (ad torum) modice puberulum; calycis tubus ca. 1 mm. altus, lobis remotis concavo-acutis ca. 1.3 mm. altis. Petala 16 X 7 mm. oblonga apice oblique truncata. Filamenta 5.5 mm.; antherae cohaerentes, thecis 4.5 mm. longis cum poris duobus vero terminalibus, connectivo apice thecas non superante basi dorsaliter calcarato, calcari acuto ca. 1.8 mm. longo. Stylus 12.5 X 1 mm. sparse cum glandulis clavatis ca. 0.1 mm. longis ornatus apicem versus attenuatus ca. 0.5 mm. diam.; stigma punctiforme; ovarium 6-loculare apice conicum (cono ca. 2 mm. alto) et in collum ca. 1 mm. altum circum stylum protractum.

Type Collection: *J. Cuatrecasas 22241* (holotype NY; isotype F), collected at "monte La Guarida, filo de la cordillera sobre La Carbonera (entre Las Brisas y Albán), 1950-2000 m. alt., Cordillera Occidental, vertiente occidental, Depto. El Valle, Colombia," Oct. 18, 1946. "Arbol. Hoja coriacéa, verde clara o verde amarillenta; envés verde palida. Pétalos rosados. Anteros blanco amarillentas."

B. repens has leaf blades usually acute at the base and usually shortly plinerved; also, the calyx lobes are ovate and 4-5 mm. long. Both species have similar pubescence and stipular membranes. Another relative of *B. stipulacea* is *B. granatensis* Naud. which has papillose trichomes and much smaller leaves with closer secondary nervation.

TOPOBEA BRACHYURA (Gleason) Wurdack, comb. nov.

Blakea brachyura Gleason, Bull. Torrey Club 52: 458. 1925.

TOPOBEA BRACHYURA (Gleason) Wurdack ssp. VALLENSIS Wurdack, ssp. nov.

A. ssp. typica differt foliis paulo maioribus breviter 5-plinervibus apice breviter lateque acuminatis.

Folii lamina 8-13.5 (acumine excluso) X 3.5-8 cm. apice subabrupte acuminata (acumine anguste triangulari 0.5-1 cm. longo) breviter 5-plinervia jugo interiore 4-8 mm. supra basim inserto.

Type Collection: *J. Cuatrecasas 14923* (holotype F1295111; isotypes F, NY), collected at "hoya del río Dígua, lado izquierdo: Piedra de Moler, bosques, 900-1800 m. alt., Cordillera Occidental, vertiente occidental," Dept. El Valle, Colombia, Aug. 19-28, 1943. "Arbor alto, tallo hasta 30 cm. diam.; pétalos rosados o rosado rojizos; anteras amarillas."

Paratype: *Cuatrecasas 23871* (F), from "hoya del río Dígua, Río San Juan, 1300-1500 m. alt., abajo de Queremal a la derecha del río entre km. 52 y 53, Cordillera Occidental, vertiente occidental," Dept. El Valle, March 27, 1947.

T. brachyura ssp. *brachyura* has basally nerved leaves up to 7.5 cm. long with an abrupt narrow oblong acumen; the outer pair of primary nerves is only 1-1.5 mm. in from the margin. In ssp. *vallensis*, the outer pair of nerves (neglecting the faint marginal 3rd pair) is 2.5-9 mm. in from the margin; the inner pair of nerves diverges gradually from the midrib, with an elevated internerval upper surface segment for about 1 cm. above the blade base.

T. brachyura is closely related to *T. subbarbata* Wurdack

(vide infra), differing in the biporose anthers, closer leaf nervation, and lack of hair tufts in the lower leaf surface primary vein axils. The resemblance mentioned by Gleason to Blakea rostrata O. Berg ex Triana seems only foliar, the Peruvian species having a markedly lobed calyx and typical Blakea anthers.

TOPOBEA GRANDIFLORA Wurdack, sp. nov.

De affinitate mihi ignota, fortasse ex descr. T. andreanae Cogn. affinis.

Rami teretes primum cum petiolis pedicellisque sparse furfuracei mox glabrati. Petioli 1.5-3 cm.; lamina integra paulo coriacea 8-12 (acumine excluso) X 4.5-7.5 cm. elliptica vel ovato-elliptica apice abrupte breviterque (0.5-1 cm.) caudato-acuminata basi rotundata, breviter 5-plinervia (jugo marginali neglecto, jugo interiore 3-7 mm. supra basim inserto) nervis primariis secundariisque supra anguste impressis subtus anguste elevatis secundariis principalibus 2-3 mm. inter se distantibus, supra glabra et dense albido-punctulata, subtus modice persistenterque setulosa pilis patentibus gracilibus sublaxis 0.5-1 mm. longis basim versus papillatis. Flores 6-meri in quaque axilla 1-2, ca. 1.5 cm. pedicellati; bracteae calyce breviores late orbiculares apice rotundato-truncatae basim versus inconspicue furfuraceae exteriores imbricatae 7 X 13 mm. basim inconspicue (1-1.5 mm.) coalitae, interiores liberae 11 X 20 mm. Hypanthium (ad torum) 9 mm. altum; calyx 5 mm. altus apice truncatus non lobatus. Petala subcarnosa 24 X 13 mm. obovata apice rotundata apicem versus i.s. tuberculato-rugulosa. Filamenta 9.5 mm. longa; antherae cohaerentes 9 mm. longae attenuatae basim versus ventraliter dense albido-punctulatae apice dorsaliter uniporosae poro 0.7-0.8 mm. diam., connectivo apicem versus modice albido-punctulato dorsaliter inconspicue calcarato (calcari 0.7-0.9 mm. longo hebeti-acuto). Stylus 16 X 0.9-1.1 mm.; stigma longicapitatum 3 X 2 mm.; ovarium 6-loculare base 3 mm. inferum, apice liberum conicum (cono 3.7 mm. alto usque ad basim styli) et in collum 1.1 mm. altum circum stylum protractum collo breviter (0.5 mm.) 6-lobato.

Type Collection: R. Romero Castañeda 2939 (holotype NY), collected at La Guayacana, Tumaco, Dept. Nariño, Colombia, June 27, 1951. "Arbusto ramoso. Corola roja-Cáliz, bractea y pedunculo verdes. Anteras y estigma amarillas. Estilo y filamentas cremas."

Paratype: Killip & Garcia 33212 (NY), from edge of forest at coast, east side of Gorgona Island, Dept. Nariño, Colombia, Feb. 11, 1939. "Tree; petals deep pink."

T. andreana (ex char.) has larger (17-22 X 9-12 cm.) leaf blades, bracts equaling the calyx, and a truncate stigma. The Ecuadorian T. induta Mgf. is (ex char.) a much more pubescent species with lobed pubescent calyx, smaller petals and punctiform stigma.

TOPOBEA KILLIPII Wurdack, sp. nov.

De affinitate mihi obscura, sed in foliorum venulis laxis, floribus parvis, et bracteis laxis hypanthium superantibus evidenter distincta.

Innovationes cum pedicellis bracteis hypanthio ovarioque sparse furfuracei mox glabrati; planta alioqui glabra. Rami subteretes, cortice grisea. Petioli plerumque 1-1.5 cm. longi; lamina integra subcoriacea 5-12 X 3-7.5 cm. elliptica vel paulo obovato-elliptica apice breviter (2-10 mm.) obtuseque acuminata basi rotundata vel late acuta breviter 5-plinervia (jugo tenui marginali incluso, jugo interiore 3-4 mm. supra basim inserto) nervis secundariis supra et subtus vix distinctis 2.5-4 mm. inter se distantibus. Flores 6-meri, 1-4 in quaque axilla; pedicelli ca. 1 cm. longi; bracteae liberae demum patentes obovato-oblongae apice rotundatae calycem superantes, exteriores 7-10 X 5-6 mm., interiores paulo minores. Hypanthium ca. 3.5 mm. longum (ad torum); calycis tubus ca. 1 mm. longus, lobis ca. 1 X 2 mm. deltoideis extus carinato-tuberculatis tuberculo non eminente. Petala ca. 6-7 X 5 mm. oblique obovata apice rotundata. Filamenta submatura ca. 3 mm. longa; antherae inter se leviter cohaerentes ca. 3 mm. longae anguste oblongae apice dorsaliter biporosae, connectivo sub thecis non prolongato sed 0.7 mm. supra basim cum appendice descendenti linguiformi obtusa ca. 0.3 mm. longa armato. Stylus ca. 6 X 0.8 mm. apicem versus incrassatus (ad 1 mm. diam.); stigma truncatum; ovarium sparse tenui-furfuraceum praecipue apicem versus, vix inferum (apice libero usque ad insertionem styli ca. 1 mm. alto) truncato-conicum et in collum ca. 1 mm. altum haud lobatum circum stylum protractum.

Type Collection: *E. P. Killip 34982* (holotype NY), from a mangrove swamp, Buenaventura Bay, Dept. El Valle, Colombia, April 13, 1939. "Tree 3-4 m. high, with elongate branches; petals white; anthers yellow-green."

Paratypes: El Valle: *Killip 34939*(NY), from dense forest along highway 10-15 km. east of Buenaventura near sea level, April 12, 1939; *J. Cuatrecasas 15829* (F, NY), from "veneral, bosques, 5-50 m. alt., río Yurumangui, costa del Pacifico," Jan. 28-Feb. 10, 1944. Cauca: *Lehmann 8977* (NY), forests of Río Timbiqui, Dec. 1898.

In Cogniaux' key, *T. killipii* would be found near *T. punctulata* Tr., a species with much larger basally attenuate leaves, firm appressed floral bracts, and "linear" petals. The stamen and ovarial characters are reminiscent of *T. brachyura* (Gleason) Wurdack and *T. subbarbata* Wurdack (vide infra) but both of these differ widely from *T. killipii* in foliar and bract characters. T. killipii is rather variable in development of the short-acuminate leaf apex and the Lehmann collection has subcordulate leaf bases; in *Killip 34939*, the main stem leaves are 3-whorled, the branchlet leaves opposite.

TOPOBEA LONGILOBA Wurdack, sp. nov.

Ex descriptione et photicone *T. ciliatae* Cogn. affinis, sed cum ramulis non setosis et bracteis eciliatis.

Rami subteretes primum furfuracei mox glabrati. Petioli 2-3 cm. longi glabri; lamina 8-12.5 X 4-6 cm. elliptica vel paulo obovato-elliptica apice breviter (0.5-1 cm.) hebeti-acuminata basi acuta breviter 5-plinervia (jugo interiore ca. 6-8 mm. supra basim inserto) nervis secundariis principalibus plerumque 1.5-3 mm. inter se distantibus, supra primum sparse furfuracea mox glabrata, subtus in nervis sparse furfuracea alioqui glabra. Flores 6-meri in quaque axilla 4-5 seriatim fasciculati; pedicelli 1.5-3 cm. longi sparse furfuracei; bracteae liberae cum calycis lobis extus hypanthioque primum sparse furfuraceae demum glabratae, exteriores 7.5-8.8 X 3.3 mm. anguste ovatae acutae, interiores 6-7 X 4.5 mm. obovato-ellipticae apice obtusae vel rotundatae. Hypanthium 5.5 mm. longum ad torum; calycis tubus 1.4-1.5 mm. altus, lobis 6.8 X 3.5 mm. oblongis vel obovato-oblongis apice obtusis. Petala 9-10 X 5.8-6.3 mm. elliptico-oblonga apice hebeti-acuta. Filamenta 4.1-4.3 mm.; antherae discretae ca. 1.1 mm. crassae apice dorsaliter uniporosae poro 0.3 mm. diam.; thecae 4.5-4.6 mm. longae, connectivo basi dorsaliter calcarato (calcari 0.7-0.9 X 0.5 mm. triangulari acuto). Stylus 10 X 0.7-1.1 mm. centraliter incrassatus supra et subtus attenuatus; stigma subpunctiforme 0.4 mm. diam.; ovarium 6-loculare 2.2 mm. inferum, apice libero truncato-conico 1.5 mm. (collo excluso) alto et in collum crassum 1 mm. altum circum stylum protracto.

Type Collection: *J. Cuatrecasas 11632* (holotype F 1234968), collected at "alta cuenca del río Putumayo en el Valle de Sibundoy, bosque paramero en el filo de la Cordillera, La Cabaña, 2800 m. alt." Comisaría del Putumayo, Colombia, Jan. 2, 1941. "Arbusto epifito; petalos blancos ligeramente bordeados de lila pálido."

T. ciliata has setulose branchlets, long-caudate leaf blades, much shorter pedicels, and ciliate bracts and calyx lobes. The type photograph (F36333) of *T. ciliata* shows rather extreme anisophylly, a feature not mentioned in the original description and one strongly reminiscent of *Blakea ciliata* Mgf. Unfortunately, the New York isotype of *B. ciliata* has no anthers. The calyx lobes and anthers of *T. longiloba* are reminiscent of those of such anisophyllous species of T. anisophylla Tr., T. reducta Gl., and T. longisepala Gl.; perhaps this relationship will prove more valid than the one suggested with T. ciliata.

TOPOBEA SUBBARBATA Wurdack, sp. nov.

T. barbatae Gleason affinis, sed cum foliis minoribus ovato-ellipticis apice acuminatis nervis secundariis creberrimis, floribus minoribus.

Rami glabri obtuse quadrangulati, cortice demum paulo dehiscente. Petioli 1.5-2.5 cm. longi glabri; lamina integra subcoriacea utrinque paulo nitidula 7-11.5 (acumine excluso) X 3.5-6 cm. ovato-elliptica apice breviter (5-10 mm.) subabrupteque hebeti-acuminata basi late acuta vel anguste obtusa breviter 5-plinervia (jugo interiore 2-4 mm. supra basim inserto) nervis secundariis crebris principalibus 0.5-1 mm. inter se distantibus, supra et subtus primum cum pedicellis bracteis hypanthioque sparse tenui-furfuracea mox glabrata, subtus in axillis jugi interiori venarum primariarum persistenter setulosa (setis ca. 1 mm. longis). Flores 6-meri in quaque axilla plerumque 3-4 (sed usque ad 6); pedicelli plerumque ca. 1 cm. longi; bracteae orbiculares apice rotundatae, exteriores 4 X 4-4.5 mm. basi 0.5-1 mm. coalitae, interiores 3.8-4 X 5.5 mm. liberae. Hypanthium usque ad torum 3.2 mm. longum; calycis tubus 1.3 mm. altus, lobis 0.7-0.8 X 2.2 mm. late semicircularibus apice rotundatis extus apice inconspicue tenui-furfuraceis. Petala 8-8.5 X 3.8-4.5 mm. late oblanceolata apice rotundata. Filamenta 4.5-5 mm.; antherae inter se liberae anguste oblongae 4 X 0.6 mm. apice uniporosae (poro 0.4 mm. diam.), connectivo 0.3 supra basim dorsaliter appendiculata, appendice descendente linguiformi 0.5 X 0.2 mm. extremitate rotundata. Stylus 8 X 0.7 mm.; stigma subcapitellatum 0.9 mm. diam.; ovarium glabrum 1 mm. inferum apice libero (usque ad insertionem styli) truncato-conico 1 mm. alto 6-sulcato et in collum 1.4 mm. altum circum stylum protracto collo per 0.4 mm. 6-lobato.

Type Collection: J. Cuatrecasas 22197 (holotype NY; isotype F), collected at "monte La Guarida, filo de la cordillera sobre La Carbonera (entre Las Brisas y Albán), 1950-2000 met. alt., Cordillera Occidental, vertiente occidental," Dept. El Valle, Colombia, Oct. 17, 1946. "Arbol epifito. Ramas tortuosas y divaricadas con follaje aplanado. Hojas subcoriáceas, flexibles, verde claro brillantes haz, verde pálidas envés. Cáliz verde. Pétalos blancos. Anteras amarillo pálidas."

Paratype: J. Cuatrecasas 22352 (F, NY), from "hoya del río Albán, Quebrada Robada, Alto Bonito, 1800-1900 m. alt., Cordillera Occidental, vertiente occidental," El Valle, Oct. 20, 1946.

T. barbata has obovate leaf blades 11.5-15 X 7.5-9.5 cm. with principal secondary nerves 1.5-3 mm. apart, the hypanthium plus calyx 11.3 mm. long, petals 16 mm. long, and anthers 6.4 mm. long. Another relative is T. brachyura (Gleason)

Wurdack (vide supra).

TOPOBEA SUBSESSILIFLORA Wurdack, sp. nov.

T. longisepalae Gleason affinis, sed cum foliis minoribus basi acutis glaberrimis, ramis glabris, calycis lobis brevioribus.

Rami teretes cum foliis glabri. Petioli 1-2 cm.; lamina in magnitudine plerumque paulo dimorphica integra tenuiter coriacea 7-13.5 (acumine excluso) X 3-6 cm. elliptica vel paulo obovato-elliptica apice subabrupte acuminata (acumine hebeti ca. 1-1.5 cm. longo) basi anguste acuta (paulo decurrens) breviter 5-plinervia (nervis interioribus 4-6 mm. supra basim insertis, jugo exteriore debiliore) nervis primariis supra anguste impressis subtus prominentibus secundariis supra vix perspicuis subtus elevatis ca. 2 mm. inter se distantibus tertiariis vix notatis. Flores 6-meri in quaque axilla 1-2 brevissime (2-3 mm.) pedicellati, pedicellis (cum bracteis extus hypanthioque) pube tenuissime amorphica albida dense vestitis. Bracteae hypanthium aequantes, exteriores 4 X 3 mm. ellipticae apice late acutae extus prominenter unicostatae basi vix coalitae, interiores liberae 3.2 X 3 mm. suborbiculares. Hypanthium 3 X 3 mm. (ad torum); calycis tubus 1.1 mm. altus, lobis paulo imbricatis 1.7 X 1.9 mm. late ovatis apice obtusis. Petala 7.5 X 2.8-3.4 mm. obovato-oblonga apice obtusa centraliter apicem versus subcarnosa et dense punctulata. Filamenta 2.7 mm. longa; antherae 1.7 mm. longae lanceolato-oblongae apice dorsaliter uniporosae (poro ca. 0.2 mm. diam.), connectivo in calcar conicum obtusum dorsale 0.6 mm. longum prolongo. Stylus 4.7 X 0.5-0.2 mm. apicem versus attenuatus; stigma punctiforme; ovarium liberum 6-loculare apice in collum lobulatum 0.8 mm. altum circum stylum protractum.

Type Collection: *J. Cuatrecasas 17191* (holotype NY; isotypes F, NY), collected at "Barco, río Cajambre, Costa del Pacifico, 5-80 m. alt.," Dept. El Valle, Colombia, April 21-30, 1944. "Bejuco epifito. Hoja coriácea, verde grisacea haz, claro envés. Pétalos blancos. Anteras amarillas."

T. longisepala has leaf bases rounded, the lower leaf surface veins (together with the branches, bracts, and hypanthium) granular-puberulent, and sepal lobes about 3.5 mm. long. One feature of *T. longisepala* not noted in the original description is the anisophylly, the smaller caducous leaves apparently attaining a length of only about 3 cm. This feature would key *T. longisepala* to near *T. glabrescens* (ex descr.).

TOPOBEA TETROICI Wurdack, sp. nov.

T. punctulatae Tr., *T. floribundae* Gl., et *T. pubescenti*

Gl. affinis sed cum calyce distincte lobato lobis subspathulatis, petiolo corrugato-alato.

Rami rotundato-quadrangulati primum dense rufo-pubescentes, pilis intertextis appressis, tarde glabrati. Petioli inter se subconnati ca. 3 cm. longi anguste corrugato-alati; lamina subcoriacea integra 23-27 (acumine excluso) X 13-14.5 cm. apice breviter (ca. 1.5 cm.) subabrupteque acuminata basi paulo attenuata, 5-nervia (nervis marginalibus inclusis) nervis secundariis principalibus 3-6 mm. inter se distantibus, supra primum tenui-furfuracea mox glabrata, subtus primum praecipue in venis dense rufo-furfuracea subglabrata. Flores 6-meri in quaque axilla 3-4; pedicelli robusti 1-2 cm. longi apicem versus verrucosi cum bracteis exterioribus calycis lobisque tenuissime amorphofurfuracei mox glabrati. Bracteae liberae calycem superantes, exteriores 16-17 X 11 mm. obovatae apice acutae et paulo acuminatae, interiores glabrae 11.5-12 X 10.5 mm. obovato-suborbiculares apice truncato-rotundatae. Hypanthium 5 mm. longum (ad torum) glabrum; calycis tubus ca. 1.5 mm. altus, lobis 2.2 mm. longis subspathulatis apice rotundatis cum sinibus concavis. Petala 17 X 11.5 mm. obovata apice rotundata. Antherae cohaerentes apice dorsaliter uniporosae poro 0.5-0.6 mm. diam.; filamenta 6 mm. longa; thecae 6.1 mm. longae, connectivo basi dorsaliter calcarato (calcari 0.4 mm. longo acuto). Stylus 14 X 0.9-0.6 mm. apicem versus gradatim attenuatus; stigma truncatum; ovarium liberum apice in collum 2.8 mm. altum circum stylum protractum.

Type Collection: J. Cuatrecasas 23877 (holotype F 1300645), collected at "hoya del río Digua, Río San Juan, 1300-1500 m. alt., abajo de Queremal a la derecha del río entre km. 52 y 53, Cordillera Occidental, vertiente occidental," Dept. El Valle, Colombia, Mar. 27, 1947.

T. floribunda has basally rounded leaf blades, broadly triangular calyx lobes only 1-1.3 mm. long, and a longer blunt dorsal anther connective appendage. T. punctulata has bracts only 6 mm. long and an obscurely lobed calyx. T. pubescens has basally rounded leaf blades, triangular sepals only about 1 mm. long, a much longer anther calcar, and a laciniate ovary corona, as well as much more granular cauline and inflorescence puberulence.

A NEW SPECIES OF *PRESTONIA* FROM BRAZIL

Joseph V. Monachino

PRESTONIA LEPTOLOBA Monachino, sp. nov.

Frutex scandens, caule minute puberulo; foliis glabris ovato-lanceolatis 18--23 cm. longis, 8.5 cm. latis, ad basin obtusis, ad apicem breviter acuminatis; inflorescentiis supra furcatis racemoso-subumbelliformibus, pedunculo elongato, pedicellis usque ad 3.5 cm. longis puberulis; calyce ad basin gibboso, lobis extus puberulis erectis deltoideo-ovatis ca. 2.6 mm. longis, 2.4 mm. latis, ad apicem subacutis; squamellis integris vel obscure denticulatis; corolla salveriformi, parte superiore extus parce puberula, tubo 12 mm. longo, parte superiore intus pilosa, lobis patentibus 7--8 mm. longis, annulo faucali leviter incrassato, appendicibus epistaminalibus ca. 1 mm. longis proxime apicem tubi corollae insertis et orem aequantibus; staminibus proxime apicem tubi corollae insertis; antheris exsertis dorso hirtellis 5.4 mm. longis; ovario glabro, nectariis disjunctis ca. 1 mm. longis.

Vine, the stem minutely puberulent, the leaves glabrous, ovate-lanceolate, 18--23 cm. long, about 8.5 cm. broad, obtuse at base, short-acuminate at apex, nitidous above, pale beneath and punctate with minute dark dots, the lateral nerves arching, about 11 pairs; inflorescence forked above, racemose-subumbelliform, the peduncle elongated, over 15 cm. long (?), the pedicels long and slender, up to 3.5 cm. long, minutely puberulent; calyx strongly gibbous at base, the lobes medially thickened, minutely puberulent without, erect, deltoid-ovate, small, about 2.6 mm. long, 2.4 mm. broad, acutish at apex, the squamellae entire or obscurely denticulate; corolla salverform, slightly constricted at throat, obscurely puberulent outside on upper part, the tube 12 mm. long, pilose within in staminal region, the lobes spreading, dolabriform, 7-8 mm. long and about as broad, the faucal annulus lightly thickened, the epistaminal appendages about 1 mm. long, inserted near apex of corolla-tube and reaching its orifice; stamens inserted near summit of corolla-tube, the anthers conspicuously exserted, hirtellous on back, 5.4 mm. long, their sharp basal lobes 0.83 mm. long, the filaments about 2 mm. long, pilose on inner margin; ovary glabrous, the nectaries separate, equaling the ovary in length, about 1 mm. long.

Type: *Ricardo de Lemos Fróes 21391*, Brazil, Amazonas, Iraruca, Içana, Caatinga; Nov. 16, 1945; cipó, flores branco violeta, latex; deposited at The New York Botanical Garden.

Prestonia leptoloba is very distinctive. It is easily separated from all the species in Section *Annulares* in Woodson's monograph (Ann. Mo. Bot. Gard. 23: 296. 1936) by its small calyx-lobes and all in the Section *Acutifoliae* by its greatly exserted anthers.

In reviewing the species of Prestonia, a problem developed regarding Echites leptoloba Stadelm. The species is incorrectly placed in the synonymy of P. agglutinata (Jacq.) Woods. by Woodson (Ann. Mo. Bot. Gard. 23: 279. 1936; N. Am. Fl. 29: 180. 1938), who probably was mislead by the treatment in Martius' Flora Brasiliensis. In the latter work E. leptoloba is synonymized with E. circinalis Sw., now recognized as conspecific with P. agglutinata. However, while both P. circinalis and P. agglutinata are Haitien, E. leptoloba was described from Brazil, "Japurá, Prov. Rio Negro". Is E. leptoloba actually the same as Prestonia acutifolia (Benth. ex Muell. Arg.) K. Sch.? The epistaminal appendages of the latter are sometimes reduced and might have been missed by Stadelmeyer and Mueller Argoviensis. It is significant that Manso 37, cited as E. circinalis by Mueller Argoviensis in Flora Brasiliensis, is identified as P. acutifolia by Woodson.

If the prior E. leptoloba (1841) indeed proves identical with the well-known P. acutifolia (Haemadictyon acutifolium Benth. ex Muell. Arg., 1860), there might result a re-shuffling in names. To preclude this or some other possible disturbance in nomenclature, on this score at least, I have preoccupied the specific name "leptoloba" in Prestonia, thus eliminating Stadelmeyer's species from further involvement in the genus. Such an appropriation is especially desirable as the epithet aptly describes the scale-like calyx-lobes of the new species described above.

With this nomenclatural safeguard from E. leptoloba that is here provided, it does not mean that P. acutifolia surely will remain unchallenged. Unfortunately the contrary is true; there is a likelihood that the species will eventually be submerged in Prestonia quinquangularis (Jacq.) Spreng., for the characters invoked to separate the two are hardly convincing.

MATERIALS TOWARD A MONOGRAPH OF THE GENUS VITEX. VIII

Harold N. Moldenke

VITEX ALTISSIMA L. f.

Additional citations: INDIA: Andhra: Santapau 20799 (Xa); Santapau & Wagh 20697 [Wagh 2748] (Xa); Wagh 1306 (Xa), 2359 (Xa). Bombay: J. Fernandez 1380 (Xa, Xa).

The specimens from Andhra, cited above, all consist only of leaves from sterile shoots of young trees. The petiole is braodly alate and the leaflets are distinctly serrate.

VITEX COFASSUS Reinw.

Additional literature: Kanehira, Fl. Micrones. 343. 1933; St.

John, Pacific Sci. 10: 101. 1956.

VITEX GARDNERIANA Schau.
Additional literature: N. I. Klein, Anais V Reun. Anual Soc. Bot. Bras. 223. 1956.
Klein, in the reference cited above, records the common name "jaramateia" for the species.

VITEX GLABRATA R. Br.
Additional literature: Kanehira, Fl. Micrones. 343. 1933; St. John, Pacific Sci. 10: 101. 1956.

VITEX MEGAPOTAMICA (Spreng.) Moldenke
Additional citations: BRAZIL: Paraná: Stellfeld 2326 (S). Santa Catharina: Reitz & Klein 131 [Herb. Reitz 4699] (S).

VITEX NEGUNDO L.
Additional citations: INDIA: Andhra: Santapau 20732 (Xa). Bombay: Bai 399 (Xa), 406 (Xa).

VITEX NEGUNDO var. CANNABIFOLIA (Sieb. & Zucc.) Hand.-Mazz.
Additional citations: INDIA: Bombay: Blatter s.n. [22-1-1925] (Xa).

VITEX NEGUNDO var. HETEROPHYLLA (Franch.) Rehd.
Additional citations: CULTIVATED: Germany: Herb. Hort. Berol. s.n. (Us); Herb. Link s.n. (B); Herb. Schreber s.n. [H. Alto. 1780] (Mu--641); Herb. Zuccarini s.n. [Hort. Bot. Monac.] (Mu—644); Langguth s.n. [Hort. Lipz. 10.8.46] (B); Otto s.n. (B, V); Willdenow s.n. [Berol. VI.87] (Cp). Illinois: Schantz s.n. [Chicago, 10/2/1917] (Ar--1797). Italy: Herb. Harvey s.n. [Hort. Bot. Neapol. 1812] (Du--166530), s.n. [H. P. 1820] (Du--166532); Herb. Hort. Neapol. s.n. (Cb); Paperini s.n. (S); Tenore s.n. (Mu--645). Kansas: F. C. Gates 15025 (Ka--71412). Martinique: Duss 422 [94] (N), 2396 (B, B, N), s.n. (B). Massachusetts: L. H. Bailey s.n. [Cambridge, June 21-23, 1919] (Ba), s.n. [Cambridge, Aug. 31, 1921] (Ba), s.n. [Arnold Arb., Oct. 1922] (Ba); Blazic s.n. [Aug. 14, 1922] (Gg--31489); Cornman 3515 (Ba); Herb. Arnold Arb. 3515 (A, Mi--photo, N--photo, Z—photo), s.n. [Bur. Pl. Ind. 17941] (A, K), s.n. [Bot. Gard. Cambridge, July 31, 1889] (A), s.n. [Bot. Gard. Cambridge, Sept. 12, 1890] (A); Kidder s.n. [21 July 1921] (Oa--10748); Loveland s.n. [7-24-1877] (Vt); G. M. Merrill s.n. [July 26, 1921] (Ba), s.n. [Sept. 20, 1921] (Ba); Mohr s.n. [Arnold Arb., 9/20/1895] (W—771903); Rehder s.n. [Arnold Arb., Aug. 5, 1898], in part (E--116130), s.n. [Arnold Arb., 1915] (Ur); Teuscher s.n. [Herb. Arnold Arb. 6953] (B); R. E. Torrey s.n. [Aug. 2, '43] (Ms); A. P. Wyman 3515 (Io--104299). Missouri: H. C. Jensen 259/06.8 (E--116129). Mongolia: Treviranus s.n. (Le). New Jersey: H. L. Fisher s.n.

[Wm. Savin's farm, Annandale, 9-1-1914] (E--890714), New York: Hartling s.n. [N. Y. Bot. Gard. Cult. Pl. 29997; Bur. Pl. Ind. 21976] (N, N); H. N. Moldenke 4870 (N); R. Pinkus 15700 (Kr); Rising s.n. [July 23, 1923] (Al); R. C. Schneider s.n. [N. Y. Bot. Gard. Cult. Pl. 25862; Bur. Pl. Ind. 17941] (N). Oklahoma: O. H. Calvert 150 (St--24298). Pennsylvania: Mrs. J. M. Phillips s.n. [July 10, 1934] (Cm). Russia: Herb. Hort. Bot. Petropol. s.n. [1835] (K), s.n. (K, K); Herb. Hort. Pawl. s.n. (Us). Scotland: Herb. Univ. Edinb. s.n. (Ed). Spain: Collector undesignated 12 (Q), 35 (Q). Sweden: Agardh s.n. [Hort. Lund] (S). Switzerland: Berger s.n. [La Morbola] (X); Breiber s.n. [15 Aug. 1826] (M); Reuter s.n. [Hort. Genev. 1886] (X). Trinidad: W. E. Broadway s.n. [Trin. Bot. Gard. Herb. 3515] (B, R, W--940081), s.n. [Trin. Bot. Gard. Herb. 4344] (Mi, Mi, R). Virginia: D. A. Bisset s.n. [S. P. I. 17941] (Ar--19758), s.n. [S. P. I. 21976] (Ar--19761). LOCALITY OF COLLECTION UNDETERMINED: Herb. Harvey s.n. [Hort. Burd. 1811] (Du--166531); Herb. Hort. Mens. s.n. (Cb); Herb. Linnaeus G.811, S.9 (Ls, N--photo, Z--photo); Herb. Mus. Nac. Hist. Nat. Chile 16029 (Sg); Herb. Mus. Stockholm s.n. (S); Herb. Prager 18676 (Gg--31487); Herb. Richard s.n. (S); Moll s.n. (Br). MOUNTED ILLUSTRATIONS: Curtis, Bot. Mag. 11: pl. 364. 1797 (N); Fig. 1314 (N).

VITEX NEGUNDO var. HETEROPHYLLA f. MULTIFIDA (Carr.) Rehd., Journ. Arnold Arb. 48: 258. 1947.

Synonymy: Agnus castus incisa multifida Carr., Rev. Hort. 1870: 416. 1871. Vitex incisa var. multifida C. K. Schneid., Illustr. Handb. Laubholzk. 2: 594, fig. 384 m-n. 1911. Vitex negundo var. incisa f. multifida (Carr.) Rehd. in L. H. Bailey, Stand. Cycl. Hort. 6: 3481 & 3574. 1917. Vitex negundo var. multifida (Carr.) Rehd., Man. Cult. Trees, ed. 1, 777. 1927. Agnus-castus incisa var. multifida Carr. ex Moldenke, Prelim. Alph. List Invalid Names 4, in syn. 1940.

Literature: Carr., Rev. Hort. 42: 416. 1871; C. K. Schneid., Illustr. Handb. Laubholzk. 2: 594, fig. 384 m-n. 1911; Rehd. in Sarg., Pl. Wils. 3: 33. 1916; L. H. Bailey, Stand. Cycl. Hort. 6: 3481 & 3574. 1917; Rehd., Man. Cult. Trees, ed. 1, 777. 1927; Moldenke, Prelim. Alph. List Invalid Names 4 & 51. 1940; Rehd., Man. Cult. Trees, ed. 2, 805 & 994. 1940; Moldenke in Lundell, Fl. Texas 3 (1): 83. 1942; Moldenke, Alph. List Invalid Names 4 & 54. 1942; Rehd., Journ. Arnold Arb. 48: 258. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 1 & 29. 1947; Rehd., Bibl. Cult. Trees 585. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 133, 166, & 202. 1949.

Illustrations: C. K. Schneid., Illustr. Handb. Laubholzk. 2: fig. 384 m-n. 1911.

This form differs from the typical form of the variety in having the leaflet-blades deeply pinnatifid, with the segments comparatively narrow, long, and remote.

Rehder cites *E. H. Wilson 4308* for this form and regards it as typical of it.

Citations: CHINA: Hopeh: *T. F. King 169* (S); *Limpricht 2967* (S); *H. Smith 922* (Go). Province undetermined: *A. R. Schindler 140* [Yang Chia Ping] (S).

VITEX NEGUNDO var. INTERMEDIA (P'ei) Moldenke, Revist. Sudam. Bot. 5: 3. 1937.

Synonymy: *Vitex negunda* Mill., Gard. Dict., ed. 8, no. 4. 1768 [not *V. negunda* Willd., 1832]. *Vitex negundo* f. *intermedia* P'ei, Mem. Sci. Soc. China 1 (3): 105--106. 1932. *Vitex agnus-castus* var. *incisa* Hort. ex Moldenke, Prelim. Alph. List Invalid Names 49, in syn. 1940. *Vitex incisa* Thunb. ex Moldenke, Alph. List Invalid Names Suppl. 1: 28, in syn. 1947 [not *V. incisa* Lam., 1788, nor Wall., 1895, nor Bunge, 1927].

Literature: Mill., Gard. Dict., ed. 8, no. 4. 1768; Duby in P. DC., Bot. Gal., ed. 2, 1: 377. 1828; Franch., Nouv. Arch. Mus. Paris, sér. 2, 6: 112. 1883; P'ei, Mem. Sci. Soc. China 1 (3): 105--106. 1932; Moldenke, Revist. Sudam. Bot. 5: 3. 1937; Moldenke, Geogr. Distrib. Avicenn. 3, 9, 12, & 40. 1939; Moldenke, Prelim. Alph. List Invalid Names 49 & 51. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 5, 14, 28, 30, 55, 56, 58, 75, & 104. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 82--83. 1942; Moldenke, Alph. List Invalid Names 51 & 54. 1942; Moldenke, Phytologia 2: 121. 1944; Moldenke, Alph. List Invalid Names Suppl. 1: 28. 1947; P'ei, Bot. Bull. Acad. Sin. 1: 5. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 10, 25, 45, 51, 57, 128, 133, 135, 166, & 202. 1949; Rehd., Bibl. Cult. Trees 584. 1949; Lombardo, Invent. Pl. Cult. Montevid. 235. 1954.

This variety differs from the typical form of the species in having the leaflet-blades more or less irregularly dentate or serrate with sparse teeth along the margins. It differs from var. *cannabifolia* (Sieb. & Zucc.) Hand.-Mazz. in its usually much sparser and more irregular teeth and the whitish or grayish-sordid under surface of the leaflets.

It is a mostly erect or spreading bush, shrub, or low tree, 1--5 m. tall, sometimes described as merely "semi-woody", the trunk to 15 cm. in diameter; branches and twigs slender, brownish or buff, rather acutely tetragonal, medullose, not lenticellate, rather densely short-pubescent or puberulent; nodes annulate; principal internodes 1.5--3.5 cm. long; leaves decussate-opposite, 3--5-foliolate; petioles slender, 4.5--6 cm. long, flattened and canaliculate above, rather densely short-pubescent or puberulent, slightly ampliate at the base, not noticeably disciform at the apex; leaflets subequal in size or the 2 lowermost somewhat smaller, all conspicuously petiolulate with petiolules 2--15 mm. long, margined, densely short-pubescent or puberulent like the petioles; leaflet-blades thin-chartaceous or submembranous, dark-green above (often nigrescent in drying), much lighter or sordid-gray beneath, the central one oblong, elliptic, or lanceolate, 6--11 cm. long, 1.5--4.1 cm. wide, acutely attenuate or subacuminate at the apex, more or less irregularly dentate or serrate with scattered sparse teeth, acute or short-acuminate at the base, minutely puberulent or glabrous above, densely appressed-puberulous beneath (occasionally very sparsely and obscurely so on the lower lamina of old leaves), the lateral ones similar in all respects but usually smaller; midrib very slender, flat or subimpressed above, prominent beneath; secondaries very slender, 8--15 per side, arcuate-ascending, flat or subprominulous above, prominulous beneath, not plainly joined at the margins; vein and veinlet reticulation rather sparse and delicate, usually obscure or indiscernible on both surfaces, rarely plain beneath on older glabrescent leaves; inflorescence terminal, paniculate, simple or widely branched and thyrsoid, 17--42 cm. long, 3--15 cm. wide, each panicle (or branch) composed of numerous pairs of opposite distinctly stipitate cymes, the cymules mostly conspicuously brachiate with ascending and spreading very slender branches, few- or many-flowered, canescent or sordid throughout; bracts often one pair subtending each pair of lateral panicles in the terminal thyrse; bractlets linear, numerous, 2--8 mm. long; prophylla minute, linear or setaceous, 1 mm. long or less, canescent; peduncles 4.5--7 cm. long, slender, acutely tetragonal or flattened, brown, densely short-pubescent or puberulent with canescent or sordid hairs; rachis similar to the peduncle in all respects, the sympodia often elongate, especially the basal ones; flowers fragrant; calyx broadly campanulate, 2--3 mm. long, densely white-puberulent, its rim 5-toothed with long-apiculate teeth; corolla varying from blue or bluish to violet, lavender, purple, purplish, or whitish-blue, its tube about 3 mm. long, the limb 4--7 mm. wide; fruit green (when immature).

This plant has been found by collectors in dry places, open places, open waste places, open thickets, mixed woods, open brush, open valleys, and dry land at the sides of houses, on hillsides, mountains, and rocky slopes, near streams, by the ocean, and is said to be common in lowlands, abundant in sandy soil along roadsides, and common by roadsides, growing at altitudes from near sea-level to 1700 meters. It is occasionally planted in native yards in Annam, and is said to be used medicinally as a drug plant in China. It has been collected in anthesis from May to October and in December, and in fruit from August to October. One collector notes that the plant is "1 m. diam.", but what he means by this is not clear. The Runyon 65 collection, cited below, is anomalous in its very narrow and very long-petiolulate leaflets, a condition also approached on the Herb. Missouri Bot. Gard. no. 1025098 specimen. Juliana describes the petals as "yellow" and calls it "Potentilla", but surely in error. "Potentilla" is given as a common name for the plant, but this is probably based on this error on the part of Juliana.

It has been widely mis-identified in herbaria as Vitex agnus-castus L., V. agnus-castus var. latifolia Mill., Vitex *arguacustos* L., *V. bicolor* Willd., *V. incisa* Lam., *V. negundo* L., *V. negundo* var. *cannabifolia* (Sieb. & Zucc.) Hand.-Mazz., *V. negundo* var. *incisa* (Lam.) C. B. Clarke, *V. negundo* var. *incisa* (Lam.) Garcke, and *V. negundo* var. *typica* H. J. Lam. Some botanists regard the *Vitex spicata* of Loureiro as representing this variety, rather than the typical form of the species. In the Linnean Herbarium at London sheet number 8 under genus 811 [790] is inscribed "Negundo" in the handwriting of Linnaeus himself and is probably to be regarded as the type of the species. The inflorescence is paniculate and its branches are very slender, but the leaflets are toothed more or less as in this variety. The picture on Curtis, Bot. Mag. 11: pl. 364 (1797) also somewhat resembles var. *intermedia*, but is cited by P'ei as what he called "var. *incisa*" rather than his f. *intermedia*, so I am also citing it under var. *heterophylla* (Franch.) Rehd. rather than here. None of the subspecific taxa in *Vitex negundo* is completely distinct from all the others, yet there are enough soecimens of each that are sufficiently different from each other to make the subspecific epithets useful. The *H. Smith 5597* collection was annotated by Handel-Mazzetti, for instance, as intermediate between f. *intermedia* and var. *incisa*.

It is very possible that Franchet's *Vitex incisa* var. *heterophylla*, published in Nouv. Arch. Mus. Paris, sér. 2, 6: 112 (1883) is the earliest name for this variety instead of for the var. *incisa* (Lam.) C. B. Clarke as maintained by Rehder. His original description seems to imply this, but I have not yet been able to examine his type specimen. If so, then "*heterophylla*" would become the correct varietal epithet for the taxon now under discussion and now called "*intermedia*", while Weston's "*coerulea*" would probably become the valid varietal epithet (and a most unfortunate one!) for the taxon now being called var. *heterophylla*.

The Duby collection cited below was actually the basis for his description of what he called *Vitex agnus-castus* in his Bot. Gal. 1: 377. The *Herb. Miller s.n.* at the British Museum is undoubtedly the type of *Vitex negunda* Mill., while the *Herb. Hort. Bot. Berol. s.n.* collection is the type of *V. agnus-castus* var. *incisa* Hort.

It seems most probable that the specimens of this variety cited below from Italy, Jugoslavia, and Turkey are from escaped and naturalized plants, as most certainly those from Florida, Cuba, St. Croix, and Trinidad are. The *Peronin 196* collection from Turkey, however, has this comment on its label: "abondant au bord des marais d'Anaman. Août 1872". The *Duss 2386* collection does not say if it came from a wild or cultivated plant, but I assume that it was cultivated. The *Sieber Pl. Trinit. 320* collection says "introduit et cultivé". The *McFarlin 6111* from Polk County, Florida, does not say cultivated on its labels and I am assuming that the plants were escapes.

Citations: FLORIDA: Polk Co.: *McFarlin 6111* (I). CUBA: Havana:

Ordets 11689 (Rg). ST. CROIX: Benzon 94 (Cp). TRINIDAD: Sieber Fl. Trinit. 320 (Cb, V, V). ITALY: Van Heurck s.n. [prés Pisa] (Br). JUGOSLAVIA: Dalmatia: Wibbe s.n. (I). TURKEY: Peronin 196 (Vt). INDIA: Bangalore: Venkatesh s.n. [20th June 1944] (S). Bombay: Razi 9 (Xa); Santapau 23492 (Xa). East Punjab: Koelz 4592 (N). United Provinces: U. Singh 216 (Bz--24319). MANCHUKUO: Juliana s.n. (I). CHINA: Anhwei: Fan & Li 269 (Gg--310907); Sun 1390 (N). Fukien: Baker & Baker s.n. [Foochow, 11-1-1914] (Gg--31491); Chang & Metcalf 31 (Du--200918); Cheng 1014 (Bz--24331); Chung 5000 (N); En 2722 (Bz--24330); Ging 5161 (Gg--154278), 5245 (Gg--151546), 6695 (Gg--154141); Pi 6464 (Du--250166). Hopeh: Liou 1584 (N). Hupeh: Sun 10a (N), 769 (N), 859 (N); E. H. Wilson 1241 (N), 2702 (Gg--31494). Kiangsi: Chung & Sun 737 (N); Lau 3977 (S); Tsiang 9796 (N). Kwangsi: Ching 5450 (N); Fung 21196 (N); Morse 697 (N). Kwangtung: Armacost 6 (N); W. Y. Chun 3067 (N), 3173 (N), 6547 (Du--250173); Herb. Canton Chr. Coll. 12670 (S); S. Y. Lau 20133 (N); Levine s.n. [Herb. Canton Chr. Coll. 1420] (Ka--63095), s.n. [Herb. Canton Chr. Coll. 1585] (Ka--63247); Liou 1686 (N); T. K. Peng 485 [Herb. Canton Chr. Coll. 7122; 253.7186] (I); W. T. Tsang 21004 (N); Tsui 453 (Bz--24324, N), 617 (N); Ying 1263 (Bz--24329). Kweichow: Tsiang 5725 (N); Tsiang & P'ei 5725 (S). Shansi: H. Smith 5597 (Go), 6312 (Go). Shantung: Chiao 2705 (N, N); Zimmermann 442 (Br). Szechuan: Fang 4629 (Du--252637), 5624 (N); H. Smith 1749 (Go). Province undetermined: N. J. Andersson s.n. [China] (S, S); Dunn s.n. (Cp, Cp); Osbeck 11 (S). HONAN ISLAND: E. D. Merrill 10073 (Gg--31488). FORMOSA: Oldham 383 (C); Yamamoto 2369 (N). JAPAN: Honshiu: Herb. Mus. Stockholm s.n. [Kyoto, 5/9/13] (S). HONGKONG: W. Y. Chun 6548 (Du--250172). HAINAN ISLAND: Liang 62899 (N), 63036 (N); C. Wang 32749 (N). THAILAND: Zimmermann 2 (Br, S). SUMATRA: Bruimier 128 (Bz--24472). JAVA: Backer 21415 (Bz--24454, Bz--24455), s.n. [April 1903] (Bz--24453), s.n. [Juli 1903] (Bz--24444), s.n. [Aug. 1903] (Bz--24446), s.n. [Dec. 1903] (Bz--24450, Bz--24451, Bz--24452), s.n. [Batavia, 1910] (Bz--24448); Bakhuizen van den Brink 983 (Bz--24285, Bz--24286, Bz--24287), 1645 (Bz--24436, Bz--24437, Ut--24872a); Docters van Leeuwen-Reijnvaan 5 (Bz--24439). LESSER SUNDA ISLANDS: Banka: Berkhout 440 (Bz--24473). CULTIVATED: California: Walther 230 (Ba, Gg--170618, N--photo, Z--photo). Cuba: Acuña 18499 (Es); J. G. Jack 8172 (A, N), 8357 (A, N). England: Herb. Miller s.n. (Bm). France: Collector undesignated s.n. [22 Juillet] (Dc); Duby s.n. (M); Herb. J. Gay s.n. [Jard. M. Audibert, Sept. 1821] (K); Herb. Hort. Paris s.n. [Sept. 1823] (B). Germany: Herb. Hort. Bot. Berol. s.n. (B, B); Herb. Sprengel s.n. (B). Guadeloupe: Duss 2386 (N). Indochina: Clemens & Clemens 3804 (K). Java: H. Hallier s.n. (Bz--24440, Bz--24441); Herb.

Hort. Bot. Bogor. XVK.A.XLVI.11, in part (Bz—26461, Bz); Koorders 42747b (Bz—24463, Bz—24464); Van Steenis 2857 (Bz—24278); Zollinger s.n. [Java; Herb. Reichenb. f. 169007] (V). Kansas: F. C. Gates 15026, in part (M, Se—43245). Massachusetts: Rehder s. n. [Arnold Arb., Aug. 5, 1898], in part (E—116130). Missouri: Herb. Missouri Bot. Gard. s.n. [7/27/91] (E--116145), s.n. [1930] (E--1025098). Russia: Herb. Hort. Bot. Petropol. s.n. (K); Larson s.n. [Hort. Bot. Pawl. 1829] (Cp). Switzerland: Herb. Hort. Genev. s.n. (Dc); Rome s.n. [Août 1877] (Cb). Texas: R. Runyon 65 (Ba, N--photo, W--1289650, Z--photo). Thailand: Kerr 4286 (K). Uruguay: Lombardo 7526 (N). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated s.n. (Cp); Herb. T. Anderson s.n. (Ol); Herb. Jewett s.n. (Mi, Mi). MOUNTED ILLUSTRATIONS: Fig. 1315 (N), 8667 (N).

VITEX NEGUNDO f. LAXIPANICULATA P'ei, Mem. Sci. Soc. China 1 (3): 104. 1932.

Literature: P'ei, Mem. Sci. Soc. China 1 (3): 104. 1932; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 57 & 104 (1942) and [ed. 2], 132 & 202. 1949.

This form differs from the typical form of the species in its large loose panicle, the elongated floral branches of which are about 20.5 cm. long, and in the upper surface of the leaflets being mealy-white, becoming glabrous in age. It is said to be a shrub about 6 feet tall, the flower purple or else "white or whitish". The form is based on Henry 13210 from Yuancheng, alt. 160 meters, and on Maire 6254 from the region of Kiao Kia, alt. 900 meters, collected in June, 1910, Yünnan, China.

VITEX NEGUNDO var. MICROPHYLLA Hand.-Mazz., Symb. Sin. 7: 906. 1936.

This variety differs from the typical form of the species in having almost all its leaves 5-foliolate, the leaflets 1--4 cm. long and entire, the secondaries 5 pairs, the inflorescence densely white-tomentellous, the corolla 5--8 mm. long, its tube 3 times as long as the calyx, densely short-pilose, the lower lip almost equaling the tube, the fruiting-calyx accrescent, its lobes acute, 2--3 mm. long, spreading, and the fruit densely short-pilose, much shorter than the fruiting-calyx.

The type of the variety was collected by Freiherr Heinrich von Handel-Mazzetti (no. 8781) at Ahsi on the Yangtze west of Lidjiang, northwestern Yünnan, China, at an altitude of 2050 meters, on May 29, 1916. Handel-Mazzetti cites also his no. 8006.

VITEX NEGUNDO var. SESSILIS Moldenke, Geogr. Distrib. Avicenn. 40, nom. nud. (1939); Am. Midl. Nat. 24: 754. 1940.

Literature: Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Moldenke, Am. Midl. Nat. 24: 754. 1940; Moldenke in Lundell, Fl. Texas 3 (1): 83. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 104 (1942) and [ed. 2], 166 & 202. 1949.

This variety differs from the typical form of the species in having all of its 3--5 leaflets sessile, that is, without petiolules. The corolla is said to be light-blue. The petiole is the normal length for the species.

The type of the variety was collected by J. H. Heuer at Chapman Field, Florida, from cultivated material, on August 27, 1931, and is deposited in the L. H. Bailey Herbarium at Ithaca, New York, and is Federal Plant Introduction no. 63649.

Citations: CULTIVATED: Florida: Heuer s.n. [F. P. I. 63649] (Ba—type, N--photo of type, Z--photo of type).

VITEX NEO-CALEDONICA Gandoger, Bull. Soc. Bot. France 65: 64. 1918.

Synonymy: Vitex neocaledonica Gandoger ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 151 & 202. 1949.

Literature: Gandoger, Bull. Soc. Bot. France 65: 64. 1918; Hill, Ind. Kew. Suppl. 6: 219. 1926; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 68 & 104 (1942) and [ed. 2], 151 & 202. 1949.

A tree; branchlets obscurely angular, tomentellous; leaves consistently 5-foliolate; leaflet-blades broadly ovate, acute at the apex, entire, truncate at the base, green and glabrous above, white-pulverulent beneath; inflorescence terminal, in loose corymbose racemes; pedicels short, slender, bracteolate; calyx-rim with minutely triangular-muticous teeth.

The species is based on an unnumbered collection of Debeaux from near Noumea, New Caledonia, and is known only from the original collection. It is said by Gandoger to be closely related to "V. negundo Willd.", but with leaflets that are shorter and not acuminate.

VITEX NLONAKENSIS Engl., Pflanzenw. Afr. 5 (1): 190, hyponym. 1925; Pieper in Fedde, Repert. 26: 162. 1929.

Literature: Engl., Pflanzenw. Afr. 5 (1): 190. 1925; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 43, 56, & 83. 1928; Pieper in Fedde, Repert. 26: 162. 1929; Hill, Ind. Kew. Suppl. 8: 219. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 202. 1949.

A tree, sparsely hairy or glabrous; branches scarcely angular, glabrous; leaves decussate-opposite; petioles 4—9 cm. long, glabrous; leaflets 3--5 in number, short-petiolulate, the blades membranous or thin-coriaceous, obovate, acuminat at the apex, entire, cuneate at the base, 2--11 cm. long, 1--4 cm. wide, shiny above, glandular-foveolate beneath; midrib and secondaries slightly impressed above, acutely prominulous beneath, the secondaries rather straight, distinctly arcuate-joined near the margins; inflorescence axillary, loosely cymose, dichasially branched; peduncles 5--9 cm. long; bractlets linear, about 4 mm. long; calyx campanulate, about 4 mm. long, sparsely appressed-pilose, the hairs 2- or 3-celled, with a short 1- or 2-celled basal portion and a longer more or less thickened terminal portion, the rim distinctly 5-toothed, glabrous within; corolla scarcely curvate, twice as long as the calyx, over 8 mm. long, its lobes conspicuously pilose, the tip of the upper lip to half as long as the tube, the tube less than 1 1/2 times the length of the calyx; ovary glabrous, slightly glandulose, round or ovate, not elongate.

The species is based on Ledermann 6185 from along the Nlonako in the Cameroons, and is known only from the original collection.

VITEX OBANENSIS Wernham, Cat. Talbot's Nigerian Fl. 92. 1913.

Literature: Wernham, Cat. Talbot's Nigerian Fl. 92. 1913; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 42, 54, & 83. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 47 & 104 (1942) and [ed. 2], 113 & 202. 1949.

An almost glabrous shrub; branchlets fistular; leaves 5-foliolate, long-petiolate; petioles 10--15 cm. long, very minutely puberulous; leaflets subequal, except for the two basal ones, their blades usually obovate, abruptly short-acuminate at both ends, rather scabrous above, glabrous beneath except for the minutely pubescent venation, glandulose, the terminal and lateral ones to 12 cm. long, almost 6 cm. wide, and with an acumen 1.5--2 cm. long, the basal ones 6.5--8.5 cm. long, 3--4.5 cm. wide, with an acumen 1--1.3 cm. long; petiolules of the 3 central leaflets rather long, that of the terminal one 1.3 cm. long, those of the 2 basal ones very short; inflorescence very lax, pedunculate, forming a terminal panicle, its main rachis over 20 cm. long, the lateral branches 10 cm. or more long, very minutely ferruginous-pubescent, not bracteate, the individual cymes 3- or 4-flowered; flowers small; pedicels 2--4 mm. long, pubescent; bractlets minute; calyx about 2 mm. long, 3 mm. wide at the flaring entire rim; corolla multiglandulose, its tube conspicuously curvate, about 5 mm. long, bent almost at right angles at the middle, much exserted from the calyx, the upper lobes short and very wide, the lower lip over 2 mm. long, ovate, with reflexed margins.

The type of this species was collected by Percy Amaury Talbot (no. 1044) at Oban, Northern Nigeria. The species is said to be closely related to V. thyrsiflora J. G. Baker, differing in the shape of the leaflets and the lax character of the inflorescence. It is known thus far only from the original collection.

VITEX OBOVATA E. Mey., Comm. Pl. Afr. Austr. 1: 273. 1837.

Literature: E. Mey., Comm. Pl. Afr. Austr. 1: 273. 1837; Walp., Repert. 4: 87. 1844; Schau. in A. DC., Prodr. 11: 693. 1847; H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 212 & 214. 1901; Sim, For. Fl. Cape Colony 287, pl. 120. 1907; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 53, 74, & 83. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104 (1942) and [ed. 2], 122 & 202. 1949.

Illustrations: Sim, For. Fl. Cape Colony pl. 120. 1907.

A tree; young branches angular, with short internodes, finely tawny-tomentose, later glabrous and with prominent leaf-scars;

leaves decussate-opposite, 5- (or rarely 3-) foliolate; petioles 1--1.8 cm. long, tomentose; leaflet-blades coriaceous, subsessile or short-petiolulate, obovate or elliptic-obovate, 2.5--4.5 cm. long, 1--2.5 cm. wide, very short-apiculate at the apex, entire, cuneate at the base, pubescent or tomentose when young, especially along the midrib and margins, later finely puberulent beneath or entirely glabrous on both surfaces, profusely glandulose; secondaries 6--10 per side, obscure; cymes axillary, pedunculate, divaricate, about equaling the subtending leaves, bracteate, tomentose; bracts elliptic or oblong-linear, narrowed at the base into a short petiole, pubescent along the margins below the middle, glandulose, the lower ones 1--1.2 cm. long and 3--4 mm. wide; pedicels short, 2-bracteolate; calyx campanulate, subequally 5-lobed, its tube about 4 mm. long, 10-nerved, profusely glandulose and minutely pubescent outside, glabrous within, the lobes 1.5--2 mm. long and 2--2.5 mm. wide at the base, rounded or subacute at the apex, strongly 1-nerved, finely pubescent and glandulose; corolla mauvish-white, its tube about 8 mm. long, glabrous below the middle, finely puberulous and profusely glandulose outside above the calyx, pubescent within above the insertion of the stamens along 2 anterior parallel lines extending to the base of the anterior lobe, the lobes glandulose and finely pubescent on the back and along the margins, glabrous within, the posterior lobes reflexed; stamens inserted at about the middle of the corolla-tube, included; filaments villous, dilated toward the base; ovary globose-ovoid, glandulose and pubescent on the upper two-thirds; fruit drupaceous, obconic, short-apiculate due to the persistent base of the style, shorter than the accrescent fruiting-calyx, about 5 mm. long and 4 mm. wide at the apex, finely pubescent and glandulose.

The type of this species was collected by Johann Franz Drège in a valley near the Kei River, at an altitude of less than 1000 feet, Komgha Division, Cape of Good Hope. Flanagan says it is "very rare" at the type locality. It is found among rocks on hillsides and in valleys and ascends to 1500 feet between Komgha and the Kei River. It has been collected in anthesis in November.

Because of the difficulty in distinguishing this from some of its related species, it seems worthwhile to give here the keys, slightly modified, of previous monographers. Pearson distinguishes it thus:

1. Fruiting-calyx cupuliform, the rim minutely toothed.
  2. Leaves opposite; leaflet-margins usually serrate.......... V. harveyana H. H. W. Pearson
  2a. Leaves ternate; leaflet-margins entire.................... V. geminata H. H. W. Pearson
1a. Fruiting-calyx campanulate, the margin 5-lobed or -toothed.
  3. Adult leaflet-blades glabrous or glabrescent above.
    4. Petioles less than 1 inch long; leaflet-blades obovate or elliptic-obovate, less than 1 inch wide............. V. obovata E. Mey.

4a. Petioles about 1 inch long; leaflet-blades oblong-elliptic, less than 1 inch wide............V. rehmanni Gürke.
4b. Petioles about 1 1/2 inches long; leaflet-blades oblong-elliptic or obovate, more than 1 inch wide.............. V. wilmsii var. reflexa (H. H. W. Pearson) Pieper.
3a. Adult leaflet-blades tomentose or pubescent above.
5. Cymes surpassing the subtending petioles.
6. Leaflet-blades canescent or finely tomentose........... V. zeyheri Sond.
6a. Leaflet-blades lanate-tomentose on the larger veins beneath................................V. wilmsii Gürke.
5a. Cymes shorter than the subtending petioles.............. V. pearsonii Pieper.

Pieper keys them apart thus:

1. Inflorescence longer than the subtending petioles.
2. Petioles short, only to 3 cm. long; leaflet-blades less than 2.5 cm. wide.
3. Leaflet-blades elliptic or lanceolate.
4. Leaflet-blades glabrous above, sparsely hairy beneath.. V. rehmanni.
4a. Leaflet-blades sparsely canescent-tomentose above, more densely so beneath....................V. zeyheri.
3a. Leaflet-blades narrow-ovate or obovate, without plainly visible pubescence..........................V. obovata.
2a. Petioles longer, more than 3 cm. long; leaflet-blades more than 2.5 cm. wide............................V. wilmsii.
1a. Inflorescence shorter than the subtending petioles.......... V. pearsonii.

Citations: UNION OF SOUTH AFRICA: Cape of Good Hope: Drège s. n. [in a valley near the Kei River, below 1000 ft.] (N--photo of isotype, S--isotype, Z--photo of isotype); Flanagan 578 (N, N--photo, Na--6011, S--photo, Z--photo), s.n. [MacOwan 1515] (Vt). Natal: Gerstner 3706 (Gg--310877, N).

VITEX ODORATA Huber, Bol. Mus. Goeldi 5: 219--220, pl. 4, figs. 22 & 23. 1909.

Literature: Huber, Bol. Mus. Goeldi 5: 219--220, pl. 4, figs. 22 & 23. 1909; Stapf, Ind. Lond. 6: 479. 1931; Le Cointe, A Amaz. Bras. III. Arv. e Pl. Uteis 429. 1934; Moldenke, Alph. List Common Names 24. 1939; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Phytologia 2: 121. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949.

Low tree; branchlets slender, grayish, obtusely tetragonal, short-pubescent with substrigose hairs, the younger parts and twigs very densely short-pubescent or subtomentellous with conspicuously flavescent-ochraceous or fulvous hairs; nodes not conspicuously annulate; principal internodes greatly abbreviated, 1 cm. or less in length; leaves decussate-opposite, 5-foliolate; petioles slender, about 7.3 cm. long, densely short-pubescent with flavescent-ochraceous hairs, not ampliate at the base; petiolules obsolete or to 1 mm. long and densely short-pubescent like the petioles; leaflet-blades membranous, dark-green above, brunnescent in drying, somewhat lighter beneath, very fragile, elliptic or very unequal, the central one to 15.5 cm. long and 6 cm. wide, usually more than twice as long as the lateral ones and more or less obovate, abruptly acute or obtusely short-acuminate at the apex, entire, long-acuminate at the base and cuneately prolonged into the petiole, rather sparsely puberulent above, densely short-pubescent or shortly fulvous-tomentose beneath, the lateral ones exactly similar or obovate-lanceolate and considerably smaller; midrib slender, plane or subimpressed above, rounded-prominent beneath; secondaries very slender, 7--15 per side, plane above, prominulent beneath, rather obscurely arcuate-joined at the margins; vein and veinlet reticulation rather sparse, indiscernible above, the larger portions subprominulent beneath; inflorescence axillary, sparse, cymose; cymes divaricate, dichotomously brachiate, with ascending branches, corymbose; peduncles very slender, 5--5.7 cm. long, densely short-pubescent with flavescent hairs; inflorescence-branches densely short-pubescent with flavescent hairs; bractlets linear, 5--8 mm. long, or the lowermost ones subfoliaceous, narrow-spatulate, and surpassing the flowers situated in the center of the first dichotomies; prophylla linear, 1--2 mm. long, densely short-pubescent with flavescent hairs like the bractlets; pedicels very slender, to 1 mm. long and flavescent-pubescent or obsolete; calyx campanulate, about 3 mm. long and wide, densely short-pubescent, its rim very shortly lobed, the lobes shortly semiorbicular, minutely apiculate; corolla hypocrateriform, its tube more than twice as long as the calyx, often to 1 cm. long, pubescent on the outside, ampliate above, its central inferior lobe greatly enlarged, about 7 mm. long, obovate, rounded-undulate at the apex, bearded at the base within, the 4 outer lobes much smaller, ovate, about 3 mm. long, obtuse; stamens and style exserted, the stamens protruding 3 and 4 mm. from the corolla-mouth, the filaments minutely puberulous; style projecting about 5 mm. from the corolla-mouth, glabrous; stigma bifid; fruiting-calyx and fruit not known.

The type of this endemic species was collected by Adolfo Ducke (no. 2522) on the campo at Chaves, Isla de Marajo, Amazonas, Brazil, on December 3, 1901, and is deposited in the herbarium of the Goeldi Museum at Belém. Huber states that the inflorescences of this species are more extensive than those of any other Amazonia species known to him at that time and that the flowers are pleasantly fragrant and attractive to insects. He says that because of its more or less persistent bracts this species approaches in appearance *V. hypoleuca* Schau. from Bahia and *V. vauthieri* P. DC. from Rio de Janeiro. He points out that the large leaves, sessile or subsessile leaflets, and the leaflet-blades being long-attenuate at the base are quite reminiscent of *V. flavens* H.B.K. Le Cointe, in the reference cited above, records the common name "tarumá cheiroso". Ducke calls it "petit arbre de campos"; Huber calls it "taruman cheiroso". Stapf dates the original publication as "1907--08", but it seems actually to have been 1909.

Citations: MARAJO ISLAND: Ducke 2522 (Cb—isotype, F—601882—fragment & photo of type, N—fragment of isotype, N—photo of isotype, Z—photo of isotype).

VITEX ORINOCENSIS H.B.K., Nov. Gen. & Sp. Pl., ed. pict., 2: 200. 1818.

Literature: H.B.K., Nov. Gen. & Sp. Pl., ed. pict., 2: 200. 1818; Jacks., Ind. Kew. 2: 1214. 1895; Pittier, Supl. Plant. Usual. Venez. 54—55. 1939; Moldenke, Geogr. Distrib. Avicenn. 20. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 32 & 104. 1942; Pittier, La Mesa Guanipa 56. 1942; Moldenke, Phytologia 2: 121. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 65 & 202. 1949.

A small tree; branchlets and twigs rather slender, stramineous, obtusely tetragonal, lenticellate, the younger parts densely short- and appressed-puberulent with canescent hairs, the older parts becoming less so or even glabrescent; nodes not noticeably annulate; principal internodes 0.7—5.5 cm. long; leaf-scars rather corky and prominent; leaves decussate-opposite, uniformly 5-foliolate; petioles slender, 1—3.5 cm. long, convex beneath, conspicuously flattened above, puberulent with very short canescent hairs throughout, not noticeably ampliate at the base nor disciform at the apex; leaflets very unequal in size, the central one largest, the 2 lateral ones somewhat smaller, and the 2 lowest usually much reduced, the 3 middle ones petiolulate on very slender puberulent petiolules which are decidedly flattened and margined above, the 2 lowest sessile or subsessile; leaflet-blades very thin-chartaceous or submembranous, bright-green above, lighter beneath, not normally brunnescent in drying, the central one oblong-elliptic, elliptic, or subobovate, 5—11 cm. long, 2—4 cm. wide, acuminate at the apex and usually caudate (the acumination to 2.5 cm. long, bluntly acute or obtuse at the tip), entire, acute or acuminate at the base, often rather attenuate, glabrate above, obscurely puberulent beneath especially on the larger venation, the lateral ones similar but smaller and often less caudate at the apex and less attenuate at the base; midrib slender, mostly subimpressed above, prominent beneath; secondaries slender, numerous, close together, 11—13 per side, ascending, rather straight, not much or hardly at all arcuate except at the margins where they are rather obscurely arcuate-joined, flat or obscurely subprominulent above, prominulent beneath; vein and veinlet reticulation fine, abundant, usually subprominulent on both surfaces; inflorescence axillary, cymose, 7.5—11 cm. long, 2.5—5.5 cm. wide, with about 4 main branches emerging in subumbellate fashion at one point, ascending-divaricate, each 2—4 cm. long and again once or twice furcate and rather many-flowered; peduncles slender, conspicuously flattened, 5—6 cm. long, densely short-puberulent like the twigs and petioles; bracts none; bractlets few, linear, 2—3 mm. long, puberulent; prophylla minute, linear, to 1 mm. long, puberulent; pedicels pubescent; calyx campanulate, pubescent, its rim obsoletely 5-toothed; corolla blue or bluish, resembling that of V. agnus-castus L. in size, its tube ampliate above, its limb 2-lipped, the upper lip bifid, the lower lip trifid, the lower middle lobe largest, subcordate, undulate-crenulate along the margins, white-spotted and barbate at the base; fruiting-calyx and fruit unknown.

The type of this species was collected by Aimé Jacques Alexandre Bonpland (no. 832; Herb. Willdenow 11704) at Boca de Meta, the junction of the Río Meta and Río Orinoco, Amazonas, Venezuela, and is deposited in the Humboldt and Bonpland Herbarium at the Muséum National d'Histoire Naturelle in Paris. Pittier, in his 1942 publication cited above, records the common name "tasajo", and says "arbol de copa redonda, las flores azulejas en panículas cortas y densas. Santa Rosa." The species is said to inhabit clear forests, blooming in April. The Spruce 3653 sometimes cited as this species, is actually var. multiflora (Miq.) Huber.

Citations: VENEZUELA: Amazonas: Bonpland 832 [Herb. Willdenow 11704; Macbride photos 39495] (E—photo of type, F—1038374—photo of type, Kr—photo of type, N—photo of type, N—photo of type, P—type, Z—photo of type). Guárico: H. Pittier 12356 (A, Cb, F—615513, Mu, N, N, Ve—12849, W—1344383).

VITEX ORINOCENSIS var. GLABRA Moldenke, Phytologia 4: 293—294. 1953.

This variety differs from the typical form of the species in having its leaflet-blades completely glabrous on both surfaces.

The type of the variety was collected by Elbert Luther Little, Jr., and Ruby Rema Little (no. 8286) in cleared riverbottom forests of the Río Meta at Puerto López, Meta, Colombia, at an altitude of 240 meters, on July 28, 1944, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is known thus far only from the type collection.

Citations: COLOMBIA: Meta: Little & Little 8286 (N—type, N—isotype).

VITEX ORINOCENSIS var. MULTIFLORA (Miq.) Huber, Bol. Mus. Goeldi 5: 217. 1909.

Synonymy: Vitex multiflora Miq., Linnaea 18: 739. 1844. Vitex orinocensis var. amazonica Huber, Bol. Mus. Goeldi 5: 217, pl. 3, figs. 19 & 20. 1909. Vitex orinocoensis var. multiflora (Miq.) Huber ex Moldenke, Alph. List Invalid Names Suppl. 1: 29, in syn. 1947.

Literature: Miq., Linnaea 18: 739. 1844; Huber, Bol. Mus. Goeldi [Mus. Para.] 5: 217, pl. 3, figs. 19 & 20. 1909; Le Cointe, A Amaz. Bras. III. Arv. e Pl. Uteis 429. 1934; Moldenke, Alph. List Common Names 29 & 31. 1939; Moldenke, Geogr. Distrib. Avicenn. 19—22, 24, 27, & 40. 1939; Moldenke, Prelim. Alph. List Invalid Names 51. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 31—33, 35, 39, 75, & 104. 1942; Moldenke, Alph. List Invalid Names 54. 1942; Moldenke, Phytologia 2: 121. 1944; Le Cointe, O Estado Para 241. 1945; Moldenke, Alph. List

Invalid Names Suppl. 1: 29. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 62, 65, 67--69, 74, 95, 166, & 202. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Lindeman, Veget. Coast. Reg. Suriname 116 & 118. 1953.

Illustrations: Huber, Bol. Mus. Goeldi 5: pl. 3, figs. 19 & 20. 1909.

This variety differs from the typical form of the species in having gray and stouter branchlets, with more uniformly shorter internodes, the twigs dark-brown when dry, the leaflets varying from 1 to 5 in number, mostly 3, very shortly and obtusely acuminate or acute at the apex, mostly all petiolulate, often brunnescent in drying, the young ones nigrescent, the vein and veinlet reticulation often obscure beneath, and the inflorescence not at all umbelloid, but widely dichotomous-brachiate, to 20 cm. long and 12 cm. wide. Bracts are also often present at the lowest furcations and are oblanceolate or spatulate, foliaceous, long-stipitate, and to 1.5 cm. long.

A low spreading or medium-sized tree, or large and handsome and to 30 m. tall, often with many trunks and an irregular rounded crown; trunks to 22.5 cm. in diameter at breast height; branches ascending; wood hard; the gray branchlets and dark-brown twigs rather stout, the younger parts densely short-puberulent with appressed canescent hairs, the older parts glabrescent; principal internodes usually abbreviated, occasionally elongated to 4 cm. on vigorous shoots; leaves decussate-opposite, 1--5-foliolate, mostly 3-foliolate; petioles slender, 1--3.5 cm. long or to 6 cm. long on shoots, puberulent with short canescent hairs throughout; leaflets unequal, mostly all very short-petiolulate or the central petiolule to 8 mm. long, deeply canaliculate and margined on shoots; leaflet-blades membranous or thin-chartaceous, becoming thick-chartaceous at time of fruiting, often brunnescent in drying, the young ones nigrescent, the central one oblong-elliptic, elliptic, or subobovate, 5--11 cm. long, 2--4 cm. wide (or to 16 cm. long and 8 cm. wide on vigorous shoots), very shortly and obtusely acuminate or acute at the apex, entire, acute or acuminate at the base, glabrous or subglabrate above, obscurely puberulent beneath (especially on the larger venation), the lateral ones similar in all respects, but smaller; midrib very slender, flat above, prominulent beneath; secondaries very slender, close together, numerous, 8--15 per side, rather straight and ascending, arcuately joined at the margins beneath, flat above, prominulous beneath; vein and veinlet reticulation abundant and fine, mostly obscure on both surfaces; inflorescence axillary, cymose, widely dichotomous-brachiate, to 20 cm. long and 12 cm. wide; peduncles slender, conspicuously flattened, 5--10.7 cm. long, densely short-puberulent; bracts often present at the lowest furcations, oblanceolate or spatulate, foliaceous, long-stipitate, to 1.5 cm. long; bractlets and prophylla linear or setaceous, 1--2 mm. long, densely puberulent; flowers showy, fragrant, readily falling; calyx short-campanulate, about 1 mm. long, appressed-puberulent, its rim obscurely 5-toothed with very small unequal teeth; corolla varying from blue, bright-blue, sky-blue, or blue-violet to lilac, violet, purplish-pink, or purple, hypocrateriform, its tube about 4 mm. long, more or less densely appressed-puberulent outside, its lobes densely puberulent outside, obscurely pulverulent on the inner surface, the inferior median lobe much larger and darker than the others, yellowish and barbate at the base; stamens and style somewhat exserted; fruiting-calyx patelliform, about 4 mm. wide, very minutely puberulent, its rim subentire; fruit drupaceous, oblong-obovate, about 8 mm. long and 6 mm. wide, nigrescent.

The type of this variety was collected on banks of a stream near Victoria Station, Surinam, in December, 1843, by August Kappler (*no. 1366*), although some labels of this collection give the margins of woods on the Marowyne in July as the place and time of collection. The collection is also sometimes cited as "*Hostmann & Kappler 1366*", because some labels are thus inscribed. The *var. amazonica* was based by Huber on his *no. 3007* from Marajo Island, collected in November, 1902, and on *no. 434* cultivated at the Horto Botanico in Belém and collected on September 7, 1896, but originally also procured from Marajo Island. The only fruiting specimens known so far are *Jenman 6913*, *Cuatrecasas 4150*, and *J. G. Kuhlmann s.n.* [*Herb. Rio de Janeiro 22526*]. Especially large-leaved specimens are represented by *Bailey & Bailey 203* and *Herb. Rio de Janeiro 2316*.

The variety has been collected in anthesis in every month of the year except September, and in fruit in October and November. It has been confused by herbarium workers with *V. divaricata* Sw. and *V. cymosa* Bert. Its wood is used in home and industrial construction, according to Le Cointe, who records "tarumá frondoso" as a common name. Williams states that it is used for making fenceposts in Venezuela. It is said to inhabit light forests, the edges of woods, non-inundated land, savannas, swampy places, granite, and the sides of streams. Pittier describes it as a tree of the lower forest belt in Aragua, Venezuela. Haught says it is abundant in the forests of Meta, Colombia. Hohenkerk states that the flowers are "heliotrope to lilac in color, in bunches covering large portions of the tree-top". Some collectors describe the tree as low in stature, with many trunks and a rounded crown, growing on terra firma, while Huber says it is a large tree growing in the "islands" of forest on otherwise open campos.

The variety ranges from Colombia through Venezuela and the Guianas to Brazil and Amazonian Peru, ascending to 500 meters altitude. Common names include "baesi kabbassi", "guarataro", "kalebashout", "tarumá", "tarumã", "tarumá frondoso", "tarumá frondoso", "taruman", "taruma preto", "totumillo", "totumillo blanco", "turaru", and "turarú". Ducke says "floribus lilacinis cum albo". The inflorescence is very different from that of the true *V. orinocensis* H.B.K. and it should probably be regarded, as Miquel originally maintained, as a distinct species. The *Spruce 3653* collection, often labeled as from Brazil, was actually collected in Venezuela according to Spruce's own notes. The date for Huber's publication is given by Stapf as "1907--08", but appears actually to have been 1909.

Citations: COLOMBIA: Amazonas: R. E. Schultes 6880 (W--1986641). Caqueta: Ducke 1846 [Herb. Rio de Janeiro 60345] (Be--12478, N, N, W--1906577). Magdalena: Goudot B (K, P). Meta: Cuatrecasas 4150 (Jc); Haught 2818 (Gg--310878, N). Santander: Haught 2199 (N). Vaupés: Cuatrecasas 7764 (W--1774229). Department undetermined: Fior. Claes s.n. (Br). VENEZUELA: Amazonas: Holt & Blake 679 (N, S, W--1519285); Karsten s.n. [San Carlos] (V); Spruce 3653 (B, Bm, Br, Cb, Cb, Ed, F--876697, G, K, K, N, P, V, X); Ll. Williams 15177 (F--1189149, N, Ve--12879, W--1879671). Bolívar: Ll. Williams 13295 (N). Carabobo: Saer 802 (N, Ve--12872, W--1804152). Cojedes: H. Pittier 11682 (A, B, Cb, K, Mu--4379, N, Ve, W--1232589). Federal District: Moritz 1488 (B, Bm), 1726 (Bm). Guárico: Christ 3 (N, Ve, W--1233196); H. Pittier 11797 (A, B, Cb, D--630276, K, Mu--4380, N, W--1233208). Lará: Saer 422 (F--694167, F--727279, Ve). Miranda: Delgado 331 (Ve--12867, W--1833773); Tamayo 1505 (Ca--734741, Ve--12873, W--1800893). Monagas: Aristeguieta 1727 (N). State undetermined: Chardon 57 (Ve--12877). BRITISH GUIANA: Herb. Forest Dept. Br. Guian. F.647 [31a] (N); Hohenkerk 647 (K); Jenman 6918 (K); Schomburgk 206.5 (K). SURINAM: B.W., Bureau of Forestry 503 (Ut); Hostmann & Kappler 1366 (B--isotype); Kappler 1366 [Macbride photos 17562] (B--isotype, Cb--isotype, Dr--isotype, E--116174--isotype, F--663091--photo of isotype, Gt--isotype, Gt--isotype, Kr--photo of isotype, Le--type, Mu--1180--isotype, N--photo of isotype, N--photo of isotype, P--isotype, S--isotype, Us--isotype, Us--isotype, V--isotype, V--isotype, V--isotype, X--isotype, X--isotype, Z--photo of isotype), 1988 (Gt, S, Ut); Pulle 215 (Ut), 455 (Ut); Rombouts 645 (Ut), 676 (Ut); Wullschlägel 1036 (Br). FRENCH GUIANA: Brousseau s.n. [22 Aôut 1890] (P, P, P, P, P, P, P, P); Mélinon 197, in part (Bz--24260, Cb, K, P, P, W--1112703), 386 (F--539852, G, K, N, P, P, P, W--1123379); Sagot 1013 (B, Bm, K, P, P, P, P, P, S, V). PERU: Loreto: J. G. Kuhlmann s.n. [Herb. Rio de Janeiro 22526] (B, W--1517708). BRAZIL: Acre Territory: J. G. Kuhlmann s.n. [Herb. Rio de Janeiro 22525] (S, Ut). Amazonas: Ducke 1845 [Herb. Rio de Janeiro 60344] (Be--12494, N, N, W--1906576). Maranhão: Fróes 9 (W--1617854), 12 (W--1617857), 1952 (A, B, Cb, E--1042144, N, P, S, Ut). Pará: Ducke s.n. [Herb. Rio de Janeiro 15137] (Bm, Cb, P, W--1040624), s.n. [Herb. Rio de Janeiro 15593] (Bm, Cb, W--1040675), s.n. (Ja--5469); Herb. Amaz. Mus. Para. 10753 (Bm, Cb, N, P, W--1040494); Huber s.n. [Herb. Rio de Janeiro 2163] (B); Lutz 9473 (Bm, Ut). MARAJO ISLAND: Huber 3007 (Bm, Cb, Cb, E--photo, F--601816--fragment & photo, N--photo, W--1040311, Z--photo). CULTIVATED: Brazil: Archer 7722 (N); Bailey & Bailey 203 (Ba); Ducke 836 (N); Huber 484 (F--

601802--fragment & photo). LOCALITY OF COLLECTION UNDESIGNATED: Herb. Jard. Bot. Brux. s.n. (Br, Br); Herb. Martius s.n. (Br).

VITEX OSCITANS Moldenke, Phytologia 3: 443--444. 1951.

Shrub or tree; branchlets stoutish, grayish, densely puberulent on the younger parts; principal internodes apparently rather short, 1.5--2 cm. long; leaves decussate-opposite, 1-foliolate; petioles stout, 1.6--2 cm. long, very minutely puberulous or glabrescent, swollen at the apex; blades coriaceous, rather uniformly bright-green on both surfaces, very shiny beneath, broadly elliptic or obovate, 11--14 cm. long, 6--8 cm. wide, varying from subtruncate or rounded at the apex to very shortly apiculate, entire, usually somewhat revolute at the margins in drying, cuneate-acute or short-acuminate at the base, glabrous (or practically so) on both surfaces, obscurely impressed-punctate beneath; midrib coarse, flat above, very prominent toward the base beneath, rapidly diminishing in size as the apex is approached beneath; secondaries very slender, 7--9 per side, flat and mostly obscure above, prominulous beneath, divaricate-ascending, often furcate and irregularly anastomosing in many loops near the margins beneath; veinlet reticulation indiscernible above, only the larger parts prominulous beneath; inflorescence axillary, cymose, few-flowered, about equaling the subtending petioles; peduncles flattened, about 5 mm. long, densely appressed-pubescent with short cinereous hairs; cyme-branches and pedicels slender, 2--4 mm. long, densely appressed-puberulent with antrorse whitish hairs; bractlets rather large and conspicuous, spatulate, about 5 mm. long, stipitate, about 3 mm. wide at the apex, glabrous and brunnescent on one surface, the other surface densely appressed-puberulent with antrorse cinereous hairs; calyx campanulate, 5--6 mm. long and wide, very densely short-pubescent with appressed cinereous hairs outside, glabrous within, its rim often flaring, 5-toothed, the teeth broadly triangular-ovate, 1.5--2 mm. long, attenuate-acute or cucullate-apiculate at the apex; corolla infundibular, short and broad, densely villous-hirsute on the outside, more densely so toward the apex, with long sordid-brownish hairs, the tube 1--1.3 cm. long, 7--8 mm. wide at the apex, the limb rather deeply lobed, the upper lip firm or arched, the others spreading-reflexed, 4--5 mm. long; stamens and pistil surpassing the corolla-mouth by about 1 cm.; filaments pilosulous on the exserted portion; anthers about 1.5 mm. long, the 2 thecae often twisted; style glabrous, bifid at the apex.

The type of this endemic species was collected by M. Louvel (no. 81) at Tampina, Madagascar, in July, 1925, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. It is known thus far only from the original collection. A vernacular name for the plant is "fandrianagoaka".

Citations: MADAGASCAR: Louvel 81 (N--isotype, N--photo of type, P--type, Z--photo of type).

VITEX OXYCUSPIS J. G. Baker in Thistelt.-Dyer, Fl. Trop. Afr. 5: 326--327. 1900.

Literature: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 326—327. 1900; Hiern, Cat. Afr. Pl. Welw. 1 (4): 838. 1900; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 43, 56, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 46, 47, 51, & 104. 1942; Moldenke, Phytologia 2: 121. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 112, 113, 119, & 202. 1949.

A small tree, to 6.5 m. tall; branchlets glabrous; leaves 3--5-foliolate; petioles 5--7.5 cm. long; leaflet-blades membranous, green on both surfaces, obovate-cuneate, irregularly but distinctly crenate, distinctly petiolulate, with a large linear cusp at the apex, glabrous on both surfaces, the central one 15-20 cm. long and less than half as wide; inflorescence axillary, cymose, long-pedunculate, lax, the branches glabrous; calyx campanulate, about 1 mm. long, glabrous, its rim with short deltoid teeth; corolla about 3 times the length of the calyx, glabrous; fruit not known.

The type of this species was collected by Gustav Mann (no. 2243) along the Old Calabar River in Southern Nigeria. Baker states plainly that the calyx is glabrous, but Pieper in his key says for the species "Kelchhaare abstehend". Hiern and Pieper both cite Welwitsch 5671 from the Quetta Mountains, Golungo Alto, Angola. Vernacular names for the plant are "fevei", "kparseh", and "kisengi".

Citations: LIBERIA: G. P. Cooper 321 [Mus. Yale School Forest. 15228] (N). BELGIAN CONGO: Vanderyst 8154 (Br).

VITEX PACHYCLADA J. G. Baker, Journ. Linn. Soc. Lond. 20: 227-228. 1883.

Literature: J. G. Baker, Journ. Linn. Soc. Lond. 20: 227--228. 1883; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 76, 79, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104 (1942) and [ed. 2], 123 & 202. 1949.

A much-branched shrub; branches and branchlets rather stout, obtusely tetragonal, gray, very densely fulvous-villosulous on the younger parts, glabrescent in age; nodes not annulate; principal internodes 5--13 mm. long; leaf-scars comparatively small, not prominent; leaves decussate-opposite, 3-foliolate; petioles rather stout, 2.5--4.3 cm. long, very densely fulvous-tomentellous or villosulous; petiolules stout, those on the lateral leaflets 1—4 mm. long, those on the central leaflet 6--10 mm. long, all densely fulvous-villosulous; leaflet-blades thick-coriaceous, obovate, gray-green above, fulvous beneath, 3--8.5 cm. long, 2.3--5 cm. wide, very obtuse or rounded at the apex, entire and somewhat revolute-margined, very obscurely subpuberulous or glabrescent above, very densely fulvous-tomentose or lanuginous beneath, the pubescence often bright-brown; midrib slender, flat above, prominent beneath, rapidly diminishing in size as the apex is approached; secondaries slender, 4--6 per side, divaricate-ascending, hardly arcuate, flat above, prominulous but hidden by the tomentum beneath; veinlet reticulation abundant, mostly indiscernible above, prominulous but hidden by the tomentum beneath; inflorescence axillary, 6--8-flowered, congested, shorter than the subtending petioles; peduncles very short, 2--3 mm. long, densely fulvous- or brown-villous; pedicels (in fruit) stout, 2--5 mm. long, densely fulvous- or brown-villous or lanuginous; flowers not known; fruiting-calyx incrassate, cyathiform, 6--7 mm. long and wide, densely fulvous-villous, the hairs wearing off toward the rim, the teeth minute, broadly deltoid, much wider than long; fruit drupaceous, bright-brown, globose, about twice as long as the calyx, usually about 1 cm. long and 6--7 mm. wide, the pericarp much wrinkled in drying.

The type of this endemic species was collected by Richard Baron (no. 1471) in the forest at Amparimpotsy, in central Madagascar, in or before October, 1882, and is deposited in the herbarium at the Royal Botanic Gardens at Kew.

Citations: MADAGASCAR: Baron 1471 (K--type, N--isotype, N--photo of type, Z--photo of type), 4516 (K).

VITEX PACHYPHYLLA J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 328. 1900.

Literature: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 328. 1900; A. Chev., Vég. Util. Afr. Trop. Franç. 9: 281, pl. 25. 1917; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 51, 71, & 84, pl. 11. 1928; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104. 1942; Quint, Govt. French Equat. Afr. Forest. Dept. Notice 4. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 114 & 202. 1949.

Illustrations: A. Chev., Vég. Util. Afr. Trop. Franç. 9: pl. 25. 1917; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 11. 1928.

A tree, 25--30 m. tall; trunk 60--90 cm. in diameter, branchless for 15--20 m. from the base, thinly buttressed at the base; wood grayish-white, the sap- and heartwood not differentiated; bark pinkish-white, peeling off in small scales 3--4 mm. thick; branchlets glabrous; leaves 5-foliolate; petioles 5--7.5 cm. long; leaflet-blades very thick and rigid, obovate-cuneate, green and glabrous on both surfaces, obtuse or acute at the apex, entire, distinctly petiolulate, the central one 10--12.5 cm. long and 5--6.2 cm. wide, the larger venation very prominent beneath; cymes axillary, long-pedunculate, many-flowered, dense, their branches pubescent; calyx campanulate, about 3 mm. long, pubescent, the teeth cery small; corolla small, silky on the outside; fruit the size of a small plum (Prunus domestica).

The type of this species was collected by Gustav Mann (no. 994) on the banks of the Gaboon River, Gabun, French Equatorial Africa. Chevalier, in the reference cited above cites his nos. 26661 and 26669, also from Gabun, and records the common names "angona" and "evino". He says the species is a handsome tree reminiscent of the gray walnut. It is exported to Europe and he says it is common in the region of Lake Oghémoué and Lake Fernan-Vaz and in the environs of Libreville and Sibange. The wood is "bien maillé".

Citations: FRENCH EQUATORIAL AFRICA: Gabun: Klaine 794 (F--photo, N, N--photo, S, Sg--photo, Z--photo).

VITEX PADANGENSIS H. Hallier, Meded. Rijks Herb. Leid. 37: 46--47. 1918.

Literature: H. Hallier, Meded. Rijks Herb. Leid. 37: 46--47. 1918; H. J. Lam, Verbenac. Malay. Arch. 169, 213, & 370. 1919; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 63 & 104 (1942) and [ed. 2], 143 & 202. 1949.

A tree; branchlets tetragonal, ferruginous-tomentose or ochraceous-tomentose, becoming glabrescent; leaves 3--5-foliolate; petioles 5--12 cm. long; leaflet-blades "coriaceo-membranous", dark purple-violet beneath, lanceolate, cuspidate-acuminate at the apex, acute at the base, glabrous and glandulose on both surfaces except on the puberulous venation, the central one 11--17 cm. long, 5--6 cm. wide, and on petiolules 2--3 cm. long, the lower leaflets often unequal at the base and shorter-petiolulate; panicles terminal, thyrsoid, 20--25 cm. long, with 2--6 decussate branches, ferruginous- or ochraceous-tomentose; flowers unknown; fruiting-calyx patelliform, about 11 mm. in diameter, puberulous outside, glabrous and violet within, its rim shortly and irregularly 5-lobed; fruit drupaceous, ellipsoid, black, about 2 cm. long and 1 cm. wide, apiculate, glabrous.

The species is based on Korthals s.n. from near Nangallo, Padang, western Sumatra, and Beccari 726 from Ajer Mantjur, altitude 360 meters, western Sumatra, collected in August, 1878.

VITEX PANSHINIANA Moldenke, Geogr. Distrib. Avicenn. 27, nom. nud. 1939; Trop. Woods 64: 36--37. 1940.

Literature: Turcz., Bull. Imp. Soc. Nat. Mosc. 36 (2): 225. 1863; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Trop. Woods 64: 36--37. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 74. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949.

Tree, to 20 m. tall, with a rounded crown; branches very stout and woody, with corky bark, very obtusely tetragonal, gray-brown, puberulent on the younger parts and nodes or glabrous; branchlets similar but usually more acutely tetragonal and densely tomentose-pubescent with ferruginous tomentum; twigs stout, usually short, usually more acutely tetragonal, very densely villous-tomentose or hirsute with long and shaggy flavescent or ferruginous hairs; nodes somewhat suberose-annulate, but usually not conspicuously so; principal internodes 1--4 cm. long, or very much more abbreviated on branchlets and twigs; leaves decussate-opposite, 5-foliolate; petioles stout, 7--13.5 cm. long, flattened above, very densely villous-tomentose or hirsute with long and shaggy flavescent or ferruginous hairs, slightly or hardly at all ampliate at the base, somewhat disciform at the apex; leaflets usually unequal in size, the 2 lowermost considerably smaller than the 3 central ones, all subsessile or petiolulate with petiolules to 7 mm. long and shaggy-villous like the petioles; leaflet-blades submembranous, dark-green above, much lighter and yellowish beneath, the central one elliptic or varying to subobovate or oblanceolate, 10.5--19 cm. long, 3.2--5.6 cm. wide, acute at the apex, entire (or slightly undulate-repand), rather long-attenuate or cuneate at the base, densely villous or villous-tomentose above, very densely matted-tomentose and velutinous on the lamina beneath and villous on the larger venation, the hairs flavescent or ferruginous, the lateral leaflets similar but smaller, usually less distinctly petiolulate, and less attenuate at the base; midrib slender, flat above but conspicuous by being much less densely silky-villous, prominent and densely ferruginous-villous beneath; secondaries slender, 14--17 per side, arcuate-ascending, flat above, slightly prominulent beneath, rather obscurely joined at the margins beneath; vein and veinlet reticulation abundant, mostly indiscernible above, rather conspicuously sunken in the tomentum of the lamina beneath; inflorescence axillary, cymose, often somewhat subcapitate, 2--7.5 cm. long, 1.5--4.5 cm. wide, many-flowered, rather dense, usually more or less branched in a subumbelloid fashion, densely flavescent-villous throughout; peduncles rather stoutish, 1--6 cm. long, densely flavescent- or ferruginous-villous with shaggy or spreading hairs like the petioles, usually somewhat flattened; pedicels obsolete or to 3 mm. long and densely villous, obscure; bractlets linear or spatulate, to 1 cm. long, densely villous-tomentose; prophylla linear, 1--3 mm. long, tomentose; calyx cyathiform, heavy, 4--5 mm. long, about as wide as long, densely fulvous-tomentose on the outer surface, pubescent within, its rim deeply 5-lobed, the lobes ovate, 1 mm. or more long, often widely divergent or reflexed, acute; corolla hypocrateriform, varying from blue or lilac to light-violet or violet, its tube broadly cylindric, about 7 mm. long, densely tomentose on the outside, the limb conspicuously 2-lipped, the 4 smaller lobes oblong-ovate, about 4 mm. long, obtuse, the central lower lobe much enlarged, about 8 mm. long, rounded; stamens and style somewhat exserted; fruiting-calyx and fruit not seen, but the fruit described as red or purple, turning black, drupaceous, sweet.

The type of this handsome species was collected by George Gardner (no. 1817) in woods around Crato, Ceará, Brazil, in September, 1838. The collector describes it as "a large tree, common in the woods......flowering before the leaves are expanded." Some of the labels on the type collection are inscribed "1839", but a label in Gardner's own handwriting at Kew definitely states that the collection was made in September of 1838. The young leaves remind one by their pubescence of V. regnelliana Moldenke and of V. polygama var. warmingii Moldenke. It has been confused in the past with V. polygama Cham. and V. flavens H.B.K. It is said to inhabit campos and woods, blooming in September. Turczaninow, in the reference cited above, points out that the type collection belongs in section Euagnus rather than in the section with V. polygama. It is named in honor of

Alexis John Panshin (1901—), wood anatomist of note.

Citations: BRAZIL: Ceará: G. Gardner 1817 [Macbride photos 34304] (Bm--isotype, F--976259--photo of isotype, G--isotype, K--isotype, K--isotype, Kr--photo of isotype, M--isotype, N--type, N--photo of isotype, P--isotype, P--isotype, V--isotype, V--isotype, V--isotype, W--1066684--isotype, X--isotype); Luetzelburg 12524 (Mu), 25863 (Mu), 26170 (Mu, N--photo, Z--photo). Pará: Fróes 30570 (Z); Rumbelsberger s.n. [Herb. Rio de Janeiro 5967] (N); Sampaio 5662 (Ja--19244); Traill 671 (K, N). State undetermined: Freire Allemão s.n. (Ja--5962).

VITEX PANSHINIANA var. PULCHRA Moldenke, Geogr. Distrib. Avicenn. 27, nom. nud. 1939; Trop. Woods 64: 38. 1940.

Literature: Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Trop. Woods 64: 38. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104 (1942) and [ed. 2], 95 & 202. 1949.

This variety differs from the typical form of the species in its subcoriaceous mature leaflets (at time of anthesis) which are distinctly impressed-reticulate above and somewhat more shortly pubescent on the lamina above rather than long-villous. The uppermost leaves are very immature at time of anthesis, as in the species proper, but immediately below the inflorescence are fully matured leaves which are subcoriaceous in texture rather than submembranous as in the typical form of the species and are subsessile.

The type of the variety was collected by Alberto Löfgren (no. 349) as São Benedicto, Ceará, Brazil, on March 18, 1910, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. It was originally confused by Fries with V. polygama Cham., which it resembles only superficially in foliar characters. It is known only from the type collection.

Citations: BRAZIL: Ceará: Löfgren 349 (N--isotype, N--photo of type, S--type, Z--photo of type).

VITEX PARVIFLORA A. L. Juss., Ann. Mus. Hist. Nat. Paris 7: 76. 1806.

Synonymy: Vitex littoralis Decne., Nouv. Ann. Mus. Paris 3: 401. 1834 [not V. littoralis A. Cunn., 1838]. Vitex altissima Blanco, Fl. Filip., ed. 1, 516. 1837 [not V. altissima L. f., 1781, nor Moon, 1824, nor Roxb., 1829, nor L., 1955, nor Heyne, 1955]. Vitex geniculata Blanco, Fl. Filip., ed. 1, 514, in part. 1837. Vitex latifolia Blanco, Fl. Filip., ed. 1, 514, in part. 1837 [not V. latifolia Mill., 1768]. Vitex altissima Naves ex Fern.-Vill. in Blanco, Fl. Filip., ed. 3, Nov. App. 160. 1880. Vitex glaberrima Zipp. ex Span., Linnaea 15: 330. 1841. Vitex timoriensis Walp., Repert. 4: 84. 1844. Vitex leucoxylon Span. ex Miq., Fl. Ind. Bat. 2: 863. 1856 [not V. leucoxylon L. f., 1781, nor Roxb., 1814, nor Wall., 1847, nor Schau., 1893]. Vitex cofassus var. timorensis H. Hallier, Meded. Rijks Herb. Leid. 37: 47. 1918. Vitex cofassus var. pubescens

H. Hallier, Meded. Rijks Herb. Leid. 37: 48. 1918. *Vitex cofassi* var. *timorensis* H. Hallier ex H. J. Lam, Verbenac. Malay. Arch. 195, *sphalm.* 1919. *Vitex glandulosa* H. J. Lam, Verbenac. Malay. Arch. 199. 1919. *Vitex litoralis* Decne. ex Stapf, Ind. Lond. 6: 479. 1931. *Vitex littoralis* Desen., in herb. *Vitex parviflora* Decne., in herb. *Vitex parviflorum* Juss., in herb. *Vitex litoralis* L., in herb.

Literature: A. L. Juss., Ann. Mus. Hist. Nat. Paris 7: 76. 1806; Decne., Nouv. Ann. Mus. Paris 3: 401. 1834; Blanco, Fl. Filip., ed. 1, 514--516. 1837; Spanoghe, Linnaea 15: 330. 1841; Walp., Repert. 4: 84. 1844; Miq., Fl. Ind. Bat. 2: 863--865. 1856; Teijsm., Natuurk. Tijdschr. Ned. Ind. 34: 508--509. 1874; Blanco, Fl. Filip. 2: pl. 227. 1878; Fern.-Vill. in Blanco, Fl. Filip., ed. 3, Nov. App. 160. 1880; Vidal, Sin. Fam. & Gen. Pl. Leñ. Filip. [Introd. Fl. For. Filip.] Atlas pl. 75, fig. C. 1883; Ahern, Philipp. Woods 69. 1901; Heyne, Nutt. Plant. Nederl. Ind. 4: 113. 1917; E. D. Merr., Sp. Blanc. [Dept. Agr. Bur. Sci. Publ. 12]: 333. 1918; H. Hallier, Meded. Rijks Herb. Leid. 37: 47--48. 1918; H. J. Lam, Verbenac. Malay. Arch. 169, 199, 213--214, & 370. 1919; H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5 (2): 175. 1922; E. D. Merr., Enum. Philipp. Pl. 3: 395. 1923; Heyne, Nutt. Plant. Nederl. Ind. 1317. 1925; Stapf, Ind. Lond. 6: 479. 1931; Yenko & al., Philip. Journ. Sci. 55 (1): pl. 7, fig. 2. 1934; Blumea 2: 262. 1937; Moldenke, Alph. List Common Names 2, 3, 6, 7, 11, 14, 15, 17, 18, 20--22, 26, 27, & 29--31. 1939; Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Moldenke, Suppl. List Common Names 7 & 10. 1940; Moldenke, Prelim. Alph. List Invalid Names 49--52. 1940; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 27, 63, 64, 66--68, 75, & 104. 1942; Moldenke, Alph. List Invalid Names 52--55. 1942; Moldenke, Phytologia 2: 121. 1944; Menninger, Evergr. Trees Street Pl. [7--8]. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 49, 142, 144, 147--150, 166, & 202. 1949; Menninger, Winter 1950 Seed List n.p. 1950; Roig y Mesa, Dicc. Bot. 2: 825 & 1115. 1953; Menninger, Cat. Flow. Trop. Trees 16. 1953.

Illustrations: Blanco, Fl. Filip. pl. 227 (colored). 1878--1880; Vidal, Sin. Fam. & Gen. Pl. Leñ. Filip. [Introd. Fl. For. Filip.] Atlas pl. 75, fig. C. 1883; Ahern, Philipp. Woods 69. 1901; Yenko & al., Philip. Journ. Sci. 55 (1): pl. 7, fig. 2. 1934.

Small, medium, or large-sized, often gnarled tree, to 17 m. tall; trunk to 90 cm. in diameter, crooked, branched from below the middle; wood moderately or very hard and durable, heavy, brittle, dull-yellow or yellowish, burly, without taste or odor; main branches erect, rising from below the middle, ultimately wide-spreading and abundantly brachiate toward the ends; bark gray or light-gray or somewhat yellowish, shredding into fine linear plates or finely checked longitudinally; branchlets medium-slender, rather crooked, short, erect or suberect, mostly ampliate and thickened at the nodes, obtusely tetragonal, gray, lenticellate, glabrous; twigs slender, ascending, buff or brownish, yellowish-green when fresh, usually conspicuously white-lenticellate, minutely puberulent with very short canescent or brownish hairs, becoming glabrate in age; nodes annulate; principal internodes 1--4 cm. long; leaves decussate-opposite, 3-foliolate, spreading horizontally or drooping; petioles slender or stoutish, 3--7.5 cm. long, conspicuously flattened above, convex beneath, canaliculate, very sparsely and minutely pulverulent-puberulent, becoming glabrous, slightly ampliate at the base; leaflets subequal or the 2 lateral ones slightly smaller, all rather long-petiolulate on slender conspicuously canaliculate and submargined minutely pulverulent or glabrate petiolules 3--19 mm. long; leaflet-blades chartaceous, rather uniformly grayish-green on both surfaces or darker green above and lighter beneath, slightly conduplicate on the upper surface when fresh, the central one oblong-elliptic or elliptic, 4--14.5 cm. long, 2.2--5 cm. wide, acuminate or caudate at the apex, varying to acute or even obtuse on smaller leaflets, entire, wavy-margined when fresh, abruptly acute or short-acuminate at the base, minutely and obscurely pulverulent on both surfaces or glabrous and subnitid, the lateral ones similar in all respects but often less caudate at the apex; midrib yellowish when fresh, slender, flat above, prominent beneath; secondaries slender, 4--13 per side, arcuate-ascending, prominulent on both surfaces, rather indistinctly joined in many loops at the margins beneath; vein and veinlet reticulation abundant, very fine, prominent on both surfaces; inflorescence axillary and terminal, paniculate-thyrsoid, erect or ascending, 10--21 cm. long, pinkish-gray, 4.5--13.5 cm. wide, often composed of 1--5 pairs of opposite paniculate branches, sometimes simple, each panicle composed of 4--10 or more pairs of stipitate rather few-flowered or submany-flowered cymes; peduncles (2--4 cm. long) and rachis slender, similar to the twigs in texture, color, and puberulence or sometimes densely canescent-puberulent; inflorescence-branches slender, similar to the rachis in all respects, often densely canescent-puberulent; pedicels grayish or mostly obsolete; bracts often present in the larger thyrsoid inflorescences, foliaceous, 2- or 3-foliolate, long-stipitate, similar to the leaflets in all respects but much smaller; bractlets and prophylla linear, 1--3 mm. long or less, caducous; flowers odorless; corolla blue or light-blue to purplish or purplish-blue; fruit drupaceous, black, about 8 mm. wide.

This species has been found on steep slopes, rocky headlands, and grassy slopes, and in thickets near the sea, at altitudes of 10 to 300 meters, blooming in every month of the year except December, in fruit in January, March, May, June, July, and from September to December. Whitford has a photograph of three trees of this species with trunk diameters of 44, 58, and 76 cm., growing in dry limestone soil. Hagger says it is found in forests throughout the Philippine Islands, the timber being very hard and durable and one of the most valuable in the Philippines. Menninger says it is a "tall, evergreen, shady timber tree with clusters of small blue flowers", introduced into the United States by the Fairchild Tropical Garden. Roig says it was introduced into Cuba at Vivero Forestal de la Ciénaga, Havana, and "es un árbol coposo, ornamental, de hojas palmeadas y flores moradas en panículas terminales. Florece de junio a septiembre y sus flores son muy visitadas por las abejas." It is planted in forest preserves on the Hawaiian Islands. Yuncker's no. 3007 is from Punaluu Valley, Koolau Range, and does not state on its label that it is from cultivated material; Acuña 18318 also does not bear indication on its label that it was from cultivated material. On Sibuyan Elmer says it grows in shrubbery-filled dry gulches in the cogan grass region and in woods skirting the upper limit of the cogan grass at altitudes of 1000 to 1500 feet.

Herbarium material has been mis-identified as V. cofassus Reinw., V. leucoxylum L. f., V. littoralis A. Cunn., V. loureiri Hook. & Arn., V. punctata Schau., V. quinata (Lour.) F. N. Will., and V. trifolia L. Teijsmann says "een aftreksel van den bast op Timor wordt gedronken tegen geelen watersucht." Common names recorded for it are "adgaúon", "alah", "allah", "amaráun", "amuaúan", "amugaúan", "amulaúon", "anla", "bulaúen", "burikán", "edieu", "foeli kaă", "hamolaúen", "hamoráon", "hamulai", "hamulaúon", "hamuráon", "hamuyáon", "huláh", "kajoe koela", "kajoe koelah", "kalipápa", "kalipápa-bató", "kauere", "kulimpápa", "kulipápa", "malabalinanau", "maraúin", "maŭlaúin-aso", "molauin", "molaúin", "molave", "moláve", "moláve-batú", "moláve de playa", "muláon", "mulauin", "mulaúin", "muraúin", "roble de Filipinas", "sagad", "sagat", "salingkápa", "sasalit", "taga", "topas", "tugas", "tugas-abgauen", "tugas-buñgogan", and "tugas-lanhan".

Merrill states that "There is no doubt in my mind, after studying our very full series of Philippine Vitex, and Blanco's descriptions, that the three species described by Blanco are all referable to the common Vitex parviflora Juss. (V. littoralis Decne.). In both Vitex altissima and V. geniculata I interpret Blanco's description to include 3-foliolate and 5-foliolate leaves, which is probably due to the inclusion of Vitex turczaninowii Merr., for Vitex parviflora invariably has 3-foliolate leaves. Fernandez-Villar's reduction of Vitex latifolia Blanco to V. pubescens Vahl is certainly incorrect, for Blanco's description does not apply to Vahl's species, and moreover Vitex pubescens is not found in Luzon; the type of V. latifolia Blanco was from San Mateo, not far from Manila. Vitex parviflora Juss. is very common and widely distributed in the Philippines and yields the very hard timber commercially known as "molave" or "molauin"".

Stevens 1671 is infested by Meliola ganophylli Stevens, n. sp. (type). Dr. Hansford of Australia, monographer of Meliola, thinks Stevens 1670, 1712, and 1726, all from Luzon and the types respectively of Meliola benguetensis, M. pistaciae, and M. micromeli are also on the same host, but in my opinion they are on another and non-verbenaceous plant, all the same, but not *Vitex parviflora* nor any other *Vitex* species. No. 1726 is said by the collector to be on *Micromelum minutum*, 1712 on *Pistacia* sp., and 1670 on *Othophora* sp., but G. N. Jones says none of them match any species in those genera and look more like a *Vitex*. No. 1671 was said by Stevens to be on *Ganophyllum falcatum*.

Citations: PUERTO RICO: L. E. Gregory 48 (N, N); Horne s.n. [road between Mayaquey and Maricao, Aug. 1933] (N). PHILIPPINE ISLANDS: Basilan: W. I. Hutchinson s.n. [Herb. Philipp. Forest Bur. 6125], in part (Br). Guimaras: Gammill s.n. [Herb. Philipp. Forest Bur. 95] (N). Luzon: Adduru 90 (Gg--31503); Aguilar s.n. [Herb. Philipp. Forest Bur. 6016] (Bz--24529); Ahern 37Q [376] (Bz--24507); Alambra s.n. [Herb. Philipp. Forest Bur. 28086] (Bz--24505, Bz--24526); R. J. Alvarez s.n. [Herb. Philipp. Forest Bur. 18542] (Br); Barros s.n. [Herb. Philipp. Forest Bur. 18869] (Gg--31505); Bernardo s.n. [Herb. Philipp. Forest Bur. 15139] (Bz--24542); Borden s.n. [Herb. Philipp. Forest Bur. 771] (Bz--24527, N, Po--64773); M. Cenabre s.n. [Herb. Philipp. Forest Bur. 31357] (N, N); M. K. Clemens 18177 (La, La), s.n. [Herb. Philipp. Bur. Sci. 19006] (V); H. M. Curran s.n. [Herb. Philipp. Forest Bur. 4899] (Bz--24521), s.n. [Herb. Philipp. Forest Bur. 5460] (Br), s.n. [Herb. Philipp. Forest Bur. 5782] (Br), s.n. [Herb. Philipp. Forest Bur. 5844] (Bz--24533), s.n. [Herb. Philipp. Forest Bur. 10208] (N), s.n. [Herb. Philipp. Forest Bur. 10654] (Bz--24516); Curran & Merritt s.n. [Herb. Philipp. Forest Bur. 7712] (Bz--24528); Darling s.n. [Herb. Philipp. Forest Bur. 14891] (Bz--24513); G. Edaño s.n. [Herb. Philipp. Bur. Sci. 48764] (Bz--24511); A. D. E. Elmer 17286 (Bz--24540, N, S, Ut--67350), 18089, in part (N, S, Ut--67294, V); Escritor s.n. [Herb. Philipp. Bur. Sci. 21078] (N, Vt); Fénix s.n. [Herb. Philipp. Bur. Sci. 12970] (Cm, Gg--31504); S. Garcia 5 (Mi); Haenke 570 (N), 578 (N), 579 (N), 582 (N), s.n. [1792] (Gg--267595, I, Ms); Hagger 255 (N); Kienholz 421 [Herb. Philipp. Bur. Sci. 15443] (Ur); Klemme s.n. [Herb. Philipp. Forest Bur. 5243] (N), s.n. [Herb. Philipp. Forest Bur. 5247] (Bz--24535); Loher 4427 (N); Madarang s.n. [F. C. Gates 7036] (Ka--66590); E. D. Merrill 2084 (N), 2196 (N); M. L. Merritt s.n. [Herb. Philipp. Forest Bur. 18016] (Bz--24512); Oro 207 [Herb. Philipp. Forest Bur. 30832] (N); Paduada s.n. [Herb. Philipp. Forest Bur. 29810] (V); Parros & Nera s.n. [Herb. Philipp. Forest Bur. 3-143] (V); M. Ramos 1867 (Bz--24538); Reyes s.n. [Herb. Philipp. Forest Bur. 7476] (Bz--24522); Simeon s.n. [Herb. Philipp. Forest Bur. 28754] (Bz--24531); F. L. Stevens 1671 (It); Whitford 906 (N), 1243 (N). Masbate: W. W. Clark s.n. [Herb. Philipp. Forest Bur. 2526] (N, Po--64779), s.n. [Herb. Philipp. Forest Bur. 2540] (N); E. D. Merrill 3072 (N), 3079 (N). Mindanao: Ablaza s.n. [Herb. Philipp. Forest Bur. 30281] (V); Ahern 659Q [6590] (Bz--24508), 1504Q (Bz--24530); A. D. E.

Elmer 10995 (Ut--27428), 11031 (Bz--24519, N), 13440 (Bz--24506, N, Ut--33528), 14218, in part (Du--174286); Klemme s.n. [Herb. Philipp. Forest Bur. 15212] (Cm); D. P. Miranda s.n. [Herb. Philipp. Forest Bur. 20545] (Cm), s.n. [Herb. Philipp. Forest Bur. 20573] (Cm); Nee 32 (Q), 33 (Q); Quadras 344 (N); Ramos & Edaño s.n. [Herb. Philipp. Bur. Sci. 49518] (S); Reillo s.n. [Herb. Philipp. Bur. Sci. 16463] (Bz--24541); Wenzel 2759 (Au, Br, Bz--24504); Whitford & Hutchinson s.n. [Herb. Philipp. Forest Bur. 9213], in part (Ut--16456). Mindoro: Bermejos s.n. [Herb. Philipp. Bur. Sci. 1522] (Bz--24534, N); E. D. Merrill 2443 (N); M. L. Merritt s.n. [Herb. Philipp. Forest Bur. 3561] (Bz--24523); Rosenbluth s.n. [Herb. Philipp. Forest Bur. 11326] (Br, Bz--24525), s.n. [Herb. Philipp. Forest Bur. 12219] (Bz--24515). Negros: H. M. Curran s.n. [Herb. Philipp. Forest Bur. 17452] (Bz--24543); H. D. Everett s.n. [Herb. Philipp. Forest Bur. 5548] (Bz--24532). Sibuyan: A. D. E. Elmer 10995 (Bz--24520, N, Vt). Ticao: Rosenbluth s.n. [Herb. Philipp. Forest Bur. 12531] (Br). Island undetermined: Cuming 686 [Herb. Reichenbach f. 86696] (V). JAVA: Houter 12 (Bz--24249), 171 (Bz--24486). BRITISH NORTH BORNEO: M. K. Clemens 10274 (Bz--25445). SALAJAR ISLANDS: Salajar: Star 4 [Boschproefst. BB.22948] (Bz--24544); Teijsmann 13813 (Bz--24545, Bz--24546). LESSER SUNDA ISLANDS: Rot: Rahm 7 [Boschproefst. BB.6935] (Bz--24499, Bz--24500). Semaoe: Voogd 2324 (Bz--24491). Timor: Collector undesignated 450a (Ut--53407); Heyne I (Bz--24492, Bz--24493, Bz--24495); Teijsmann 5165 (Bz--24487, Bz--24488), 5165 B.H. (Vt--11607), 8935 (Bz--24501, Bz--24502, Bz--24503), 8936 (Bz--24489, Bz--24490), 8941 (Bz--24496, Bz--24497), 8944 (Bz--24498). MOLUCCA ISLANDS: Amboina: Dolleschal 118 (V). HAWAIIAN ISLANDS: Oahu: Yuncker 3007 (Dp); Degener & Park 9510 (N), 11243 (N). CULTIVATED: Cuba: Acuña 16513 (Es), 18318 (Es); Alain 3053 (Hk, Z); J. G. Jack 3374 (N, N). Florida: Fennell 435 [U. S. Plant Introd. 101265] (Oa--9232); Menninger s.n. [Stuart, August 8, 1946] (N); H. N. Moldenke 21455 (Z). Hawaian Islands: Degener & Parks 9509 (I); Fosberg 12965 (N); A. F. Judd s.n. [Dec. 1, 1930] (Bz--24251, N); M. Kerr s.n. [Degener 19361] (N). Hongkong: Ford 25 (K). Maryland: Fennell 1040 [U. S. Plant Introd. 101265] (Oa--9231). Philippine Islands: Garcia y Baza s.n. [Manila J. Bot.] (V, V); Llobrera s.n. [Herb. Philipp. Bur. Sci. 76575] (Ba). LOCALITY OF COLLECTION UNDETERMINED: C. Curtis s.n. [Langkani] (V). MOUNTED ILLUSTRATIONS: Whitford p. 583, pl. 16, part 1 (Z).

VITEX PARVIFLORA var. PUBERULENTA Moldenke, Phytologia 3: 439. 1951.

This variety differs from the typical form of the species in having the leaflet-blades decidedly puberulent on the midrib and secondaries beneath and the inflorescence densely flavescent-pubescent throughout.

The type of the variety was collected by L. Mangubat [Herb. Philipp. Bur. Sci. 1361] at Mendez Nuñez in the province of Cavité, Luzon, Philippine Islands, in August, 1906, and is deposited in the Herbarium Bogoriense at Buitenzorg. It is known thus far only from the original collection.

Citations: PHILIPPINE ISLANDS: Luzon: Mangubat s.n. [Herb. Philipp. Bur. Sci. 1361] (Bz--24536--type, N--isotype, N--photo of type, Z--photo of type).

VITEX PARVIFLORA f. STERILIS H. J. Lam ex Moldenke, Phytologia 4: 78, nom. nud. 1952.

Literature: H. J. Lam, Verbenac. Malay. Arch. 214. 1919; H. J. Lam in Lam & Bakh., Bull. Jard. Bot. Buitenz., sér. 3, 3: 57-58. 1921; Moldenke, Phytologia 4: 78. 1952.

Haec forma a forma typica speciei recedit floribus plusminusve a bracteis bracteolisque tomentosis et alabastris rudimentalibus substitutis, pedunculis inflorescentiorum ramulisque densiore flavescenti-pubescentibus vel subtomentosis, et fructibus galliformibus.

This teratological form differs from the normal form of the species in having some or all of its flowers replaced by great masses of tomentose bracts and bracteoles, among which are minute rudimentary buds containing sublunate Closterium-like objects which show under the microscope light tips and dark centers separated by plane concave toward the tips. These are doubtless the eggs of a Cecidomya insect, by the stings of which the flowers were prevented from developing. The drupes which develop are enlarged to about 9 mm., their upper walls considerably enlarged and containing a rather large number of holes, rounded above, in which live the larvae, one in each hole; the cells below them do not contain ovules. The peduncles, rachis, inflorescence-branches, and pedicels are more densely flavescent-pubescent or subtomentose.

Elmer describes it as a rather small and low tree or even shrub-like, growing in black compact soil of secondary forests at 750 feet altitude on Gamaguin Island, Mindanao, with a stem 6 or more inches in diameter, 15--25 feet tall, branched from below the middle, with spreading branches, forming a rather dense rounded crown, the leaves horizontal or drooping, slightly folded, or the margins coarsely wavy, coriaceous or subcoriaceous in texture, the flowers odorless and greenish-yellow, and the irregularly subglobose fruits green and less than half an inch long (in November). He records the common name "tugas".

Ordinarily plants that are galled through insect infestation are not worthy of special nomenclatorial designation, but in this case the changes resulting in the inflorescence are so amazing, so uniform, and so very commonly found without the obvious galling associated with such conditions, that specimens have been widely collected and distributed to herbaria all over the world. In some cases such specimens are the only specimens available of the species in a given herbarium and workers there may receive the erroneous impression that this is the normal and typical aspect of the species, relegating normal specimens, if sent in for determination, elsewhere. The condition is similar to that seen in many horticultural forms based on teratological conditions and propagated for their bizarre characteristics. The form is accurately described by Lam in the two references cited above and annotated by him with the form designation on many labels of specimens and copied as such by other herbarium workers.

Lam & Bakhuizen cited as "partly sterile" Ahern 3750 and Fénix 3 from Luzon and Elmer 14218 from Mindanao, and as "completely sterile" Ahern 389Q from Mindanao, McGregor 1218 from Bohol, Achacaso 25361 from Panay, and, from Luzon, Ahern 826Q and 7520, Ahern's Collector 2158, Borden 2022, Alzares 22120, Tamesis 11903, and Merrill Sp. Blanc. 340. Of the additional collections cited below the Herb. Philipp. Forest Bur. 1445, 6125, 7481, and 24731, Merrill 5454, Ahern 37, Haenke 566, and Sulit 63 are partly sterile, while Herb. Philipp. Forest Bur. 1218, 2158, 5815, 9213, 12398, and 28569, Ahern 389 and 752Q, Williams 2880, Ramos 16, and Kanehira 2734 are completely sterile. Merrill Sp. Blanc. 340 is partially sterile on some sheets and completely so on others. Williams states that his material came from a tree 70 feet tall, with a trunk 2 feet in diameter, with blue flowers in June; wood sections are preserved on the sheets. The Sulit 63 collection has a label stating that it is "cultivated and naturalized" on Luzon.

The type of the form was collected by Richard Crittenden Mc Gregor [Herb. Philipp. Bur. Sci. 1218] on Bohol, Philippine Islands, in May, 1906, and is deposited in the Herbarium Bogoriense at Buitenzorg.

Citations: PHILIPPINE ISLANDS: Basilan: W. I. Hutchinson s.n. [Herb. Philipp. Forest Bur. 6125], in part (Bz--24518). Bohol: R. C. McGregor s.n. [Herb. Philipp. Bur. Sci. 1218] (Bz--24554--type, N--isotype, N--photo of type, Z--photo of type). Luzon: Ahern 37 (N), 752Q [7520] (Bz--24556), 826Q [8260] (Bz--24548, Bz--24549), 3750 (Bz--24557); Ahern's Collector s.n. [Herb. Philipp. Forest Bur. 1445] (N), s.n. [Herb. Philipp. Forest Bur. 2158] (Bz--24551, N, Po--64775); R. J. Alvarez s.n. [Herb. Philipp. Forest Bur. 22120] (Bz--24552); Borden s.n. [Herb. Philipp. Forest Bur. 2022] (Bz--24550, N); H. M. Curran s.n. [Herb. Philipp. Forest Bur. 5815] (N); Eder s.n. [Herb. Philipp. Forest Bur. 28569] (Bz--24517); A. D. E. Elmer 13089, in part (Bz--24539); Fénix 3 (Br, Bz--24559); Haenke 566 (N); Leuterio s.n. [Herb. Philipp. Forest Bur. 24731] (N); Loatoc s.n. [F. C. Gates 8410] (Mi); E. D. Merrill Sp. Blanc. 340 (Bz--24555, N, V); Merritt & Curran s.n. [Herb. Philipp. Forest Bur. 12398] (Bz--24514); M. Ramos 16 (Ut--22104); Reyes s.n. [Herb. Philipp. Forest Bur. 7481] (N); Sulit 63 (N). Mindanao: Ahern 389 (N), 389Q [3890] (Bz--24547); A. D. E. Elmer 14218, in part (Bz--

24558, N, Ut--33521, V); Kanehira 2734 (N); E. D. Merrill 5454 (Br, N); D. P. Miranda s.n. [Herb. Philipp. Forest Bur. 17942] (Ka--64781, Mi, Ur); Pray s.n. [Herb. Philipp. Forest Bur. 15464] (N); Whitford & Hutchinson s.n. [Herb. Philipp. Forest Bur. 9213], in part (Bz--24524); R. S. Williams 2880 (N, N). Panay: Achacoso s.n. [Herb. Philipp. Forest Bur. 25361] (Bz--24537).

VITEX PATULA E. A. Bruce in Bruce & al., Bothalia 6: 237--238. 1951.

Literature: E. A. Bruce in Bruce & al., Bothalia 6: 237--238. 1951; Biol. Abstr. 26: 1746. 1952.

A summer-flowering shrub or small tree, 2.4--5 m. tall; branches rather straggling, spreading, subterete, gray or pale-brown, sparsely pubescent, later glabrescent, longitudinally fissured; young branchlets tomentose with pale yellow-brown hairs; leaves decussate-opposite, mostly 3-foliolate, rarely 4- or 5-foliolate; petioles 3.5--6.5 cm. long, subequaling the inflorescences, terete, not canaliculate, pubescent or when young short-tomentose; leaflet-blades submembranous, not coriaceous, sessile or subsessile, the central one obovate, 4--7.5 cm. long, 2--3.5 cm. wide, rounded or rarely subacute at the apex, entire, cuneate at the base, sparsely glandulose beneath and crisp-pubescent along the secondaries, sparsely scabridous above, more densely pubescent when young, the lateral ones smaller, obovate-elliptic, 3--6.5 cm. long, 2--3.5 cm. wide; secondaries 8--11 per side, more or less spreading, prominent beneath; tertiaries distinct, parallel to each other; cymes axillary, dichotomous, borne near the apex of the branches;peduncles 3--4 cm. long, densely pubescent or subtomentose; bractlets linear, 8--13 mm. long, pubescent or tomentose; flowers small, pedicellate; calyx obscurely bilabiate, tomentose on the outside, glabrescent within, its tube campanulate, about 2.5 mm. long, 5-lobed, the 3 anterior lobes longer than the 2 posterior ones, triangular, 1--1.5 mm. long; corolla mauve, its tube narrowly infundibular, longer than the calyx, about 4.5 mm. long, about 1.5 mm. wide at the base and 3.5 mm. wide at the apex, the lobes unequal, rounded at the apex, tomentose, the anterior one largest, transversely elliptic, 3--5 mm. long, about 4 mm. wide, the lateral ones ovate, about 2.5 mm. long and 2 mm. wide; stamens 4, inserted at the base of the corolla-tube, short-exserted; ovary globose, about 1 mm. long and wide, glabrous, with a few glands toward the apex; fruit black, ovoid, about 1.5 cm. long and 9 mm. wide.

The type of this species was collected by L. E. Codd (no. 5319) in low velt bush on a rocky hillside, at an altitude of 1500 feet, on Dzundweni Hill, 11 1/2 miles southeast of Punda Maria, in Kruger National Park, Zoutpansberg district, Transvaal, Union of South Africa.

Miss Bruce also cites for this species E. A. Bruce 172 from Kruger National Park, I. B. Pole-Evans 1951 and R. J. Rodin 4232 from Wylies Poort, Transvaal, *L. E. Codd 4163* from Zoutpansberg, Transvaal, *W. Lamont 45* from Louis Trichard, Transvaal, *Gomes e Sousa 3885* from Mozambique, *W. Lamont 27* from Portuguese East Africa, and *J. Hutchinson 2101* from Limpopo, as well as *L. E. Codd 4227* from Transvaal which I regard as *V. amboniensis* Gürke. Dr. Meeuse feels that he can separate *V. patula* from *V. amboniensis* by habit and by leaf-apex characters.

VITEX PAYOS (Lour.) Merr., Trans. Am. Phil. Soc., new ser., 24 (2): 334. 1935.

Synonymy: *Allazia payos* Lour. apud Silva Manso, Enum. Subst. Braz. 36. 1836. *Jaracatia brasiliana* Pison ex Silva Manso, Enum. Subst. Braz. 36, in syn. 1836. *Vitex hildebrandtii* Vatke, Linnaea 43: 534. 1882. *Vitex shirensis* Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 326, in part. 1900. *Vitex eylesii* S. Moore, Journ. Bot. 45: 154. 1907. *Vitex guerkeana* Engl. ex Eyles, Trans. Royal Soc. South Afr. 5: 459. 1916 [not *V. guerkeana* Hiern, 1900, nor DeWild., 1909, nor Pearson, 1928].*Vitex hildebrandii* Vatke, in herb.

Literature: Silva Manso, Enum. Subst. Braz. 36. 1836; Vatke, Linnaea 43: 534. 1882; Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 326. 1900; S. Moore, Journ. Bot. 45: 154. 1907; S. Moore, Journ. Linn. Soc. Lond. Bot. 40: 168. 1911; Eyles, Trans. Royal Soc. South Afr. 5: 459. 1916; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 49, 65--66, & 82. 1928; E. D. Merr., Trans. Am. Phil. Soc., new ser., 24 (2): 334. 1935; Hill, Ind. Kew. Suppl. 9: 297. 1938; Moldenke, Prelim. Alph. List Invalid Names 50. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50, 51, 75, & 104. 1942; Moldenke, Alph. List Invalid Names 53 & 55. 1942; Moldenke, Alph. List Invalid Names Suppl. 1: 2. 1947; Moldenke, Plant Life 2: 58 & 64. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 117, 120, 121, 166, & 202. 1949; Pardy, Rhod. Ag. Journ. 50: 186. 1953; Hauman, A. E. T. F. A. T. Index n.p. 1954; Wild, South. Rhodes. Bot. Dict. 137. 1954.

Large shrub or tree, to 8 m. tall; trunk to 22 cm. in diameter at breast height; branchlets short, densely pilose; leaves 5-foliolate; petioles stoutish, about 10.2 cm. long, tetragonal-flattened, very densely villous-tomentose with rather long cinereous hair, not noticeably ampliate at the base, somewhat disciform and more densely villous at the apex; leaflets unequal in size, the 2 lowermost ones usually greatly reduced, all very shortly petiolulate or the two lowermost subsessile; petiolules stoutish, 1--2 mm. long, flattened, margined, very densely villous with cinereous hairs; leaflet-blades chartaceous, bright- or dark-green above, albidous beneath, the central one obovate or oblong, 5--11.5 cm. long, about 5 cm. wide, rounded or obtuse at the apex, entire, narrowed or long-acuminate at the base, rather sparsely strigillose-pubescent above, rather densely pubescent-tomentose with matted and irregular whitish hairs beneath, the 2 lateral ones similar in all respects, the 2 lowermost ones usually much reduced, more oblong-elliptic or only oblanceolate, acute at the base; midrib slender, flat but usually more densely cinereous-pubescent above, prominent and densely tomentose beneath; secondaries slender, to about 10 per side, irregular, somewhat arcuate-ascending, obscure or indiscernible above, prominulent and more densely tomentose beneath; vein and veinlet reticulation rather sparse, indiscernible above, the larger portions more densely pubescent beneath; inflorescence axillary, cymose, about 13.5 cm. long and 8.5 cm. wide, about 5 times dichotomous, the first dichotomy wide-spreading and long-branched, the rest rather dense, many-flowered, densely cinereous-pubescent or incanous-tomentose or subvillous throughout; peduncles slender, about 9 cm. long, flattened, slightly ampliate at the apex and more densely villous there; cymes bearing a conspicuous central flower in each dichotomy, whose pedicel and calyx are usually more densely long-villous than those of the lateral flowers; pedicels slender, 1--3 mm. long, densely cinereous- or incanous-villosulous; bractlets linear, elongate, to 12 mm. long, densely incanous-villosulous or villous; prophylla minute, linear, hidden in the tomentum; calyx campanulate, about 2 mm. long, densely pubescent, its rim toothed, the teeth ovate; corolla heliotrope, varying to dirty-white or white with a purple lip, its tube a little longer than the calyx, very hairy, the lobes oblong; stamens not exserted; fruit green when immature, purple-black or black when ripe.

Silva Manso, in the reference cited above, states that this plant, like *Carica papaya* L., is cultivated in Brazil and abounds in oil that can be used as a laxative, especially for domestic animals. It has been collected in anthesis in June, October, and November, and in fruit in October. It grows in tree veld grasslands and among granite rocks, to an altitude of 4500 feet. Common names for it are "chikubai", "jacaratiá", "m chaukela", "m tsubvu", "mucoro", "muhubva", "mu kubvu", "mukubvu", "mu towa", "mutsubvu", "n towa", "umbalebale", "umbindoio", "um bindois", "umchangwela", and "umtschwankela".

Crook says that various birds, including lowries, Natal purple-crested bulbuls, and black-collared basbets, eat the fruit of this species. Dr. W. L. Thompson, of the American Board of Missions, who sent 32 seeds of this plant from Mount Silinda, Southern Rhodesia to the Federal Horticultural Board of the United States Plant Introduction Garden, and which were received there on June 30, 1924, says that the fruit is eaten with relish by the Rhodesian natives. "We also enjoy it occasionally", he adds. Munch and Wild also report the fruit as edible, and Pimenta says it is eaten in Portuguese East Africa. Yet Eyles makes the statement that the fruit is "not eaten". The Boivin collection cited below has a label reading "Zanzibar" but this is an error, as the collection was made on Mombasa Island.

Bakes cites for *V. hildebrandtii* the following collections and describes the leaflets as sessile: Hildebrandt 1249 from Dar-es-Salaam, *Volkens 1* from Usambara and *Holst* 2101 from

Tanga, Tanganyika Territory, and Buchanan 113 from Nyasaland. V. eylesii, based on Eyles 1201 from Bulawajo, Southern Rhodesia, was named in honor of Mr. Frederick Eyles (1864--1937), who collected some 8000 specimens in Southern Rhodesia from 1904 to within a short time of his death, according to H. Wild in a letter to me dated February 9, 1949, and not for George Eyles as erroneously stated by me in "Plant Life". Wild states that he long felt that V. eylesii and V. hildebrandtii were conspecific, but could not be sure. Pieper says "Der schmalere Tubus der Korolle bietet kein Unterschiedungsmerkmal, um V. Eylesii von V. Hildebrandtii zu trennen, da die Breite des Tubus innerhalb der Blütenstände desselben Exemplars wechselt. Auf die Unmöglichkeit der Unterscheidung von Hildebrandtii und Eylesii weisen auch schon die verschiedentlich gemachten Bemerkungen auf den Herbarbogen hin." Of the specimens cited as V. shirensis by Baker only the Whyte s.n. [Zomba] belongs here; Buchanan 231 is V. mombassae Vatke. Eyles believes that V. eylesii might be conspecific with what he called V. cienkowski Kotsch. & Peyr. (=V. doniana Sweet), a species actually very distinct from it.

Citations: BELGIAN CONGO: Brédo 3503 (Br, N), 3825 (Br, Br); Cabu 48 (Br), 107 (Br); Quarré 4311 (Br, Br), MOMBASA ISLAND: Boivan s.n. [Mombaza, 1847-1852] (N, N, P, P, P, P). ANGOLA: Lynes 636c (Br). NORTHERN RHODESIA: E. Milne-Redhead 516 (Br). SOUTHERN RHODESIA: Crook M.118 [Govt. Herb. Salisbury 31040] (N); H. M. Forbes 277 (Na--35666); Harvie 17/49 (Rh--26726); Munch 29a (Rh--16882); Whellan 473 [Govt. Herb. Salisbury 31206] (N); Wild 1253 [Govt. Herb. Salisbury 15404] (N). BRITISH NYASALAND PROTECTORATE: J. Buchanan s.n. [J. M. Wood 6970] (N, N--photo, Na--14371, Z--photo). PORTUGUESE EAST AFRICA: Quilimane: Pimenta s.n. [Govt. Herb. Salisbury 17230] (N). CULTIVATED: Florida: Fennell s.n. [U. S. Pl. Introd. 60427; Fed. Hortic. Board 52302] (Ar--19757, Ba, E--photo, E--1115781--photo, N, N--photo, W--photo, Z--photo).

VITEX PAYOS var. GLABRESCENS (Pieper) Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 79. 1942.

Synonymy: Vitex hildebrandtii var. glabrescens Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 66. 1928.

Literature: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 66 & 82. 1928; Moldenke, Alph. List Invalid Names 53. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50, 51, 79, & 104 (1942) and [ed. 2], 117, 120, 121, & 202. 1949.

This variety differs from the typical form of the species in being less densely tomentose on the youngest parts and glabrescent in age.

Pieper admits that a hard and fast boundary between the variety and the typical form of the species is difficult to draw. He based the variety on Braun 3519, Prittwitz 8, and Stuhlmann 373 from Tanganyika Territory, Buchanan 6970 from Nyasaland, and Allen 151, Engler 3120, Johnson 17 and 96, and Swynnerton 34, 1059, 1060, and 1061 from Portuguese East Africa. Herbarium material has been identified as "V. hildebrandii Vatke". A common name recorded for the plant is "tsubou".

Citations: BELGIAN CONGO: Brédo 4223, in part (Br), 4794 (Br, Br, N). SOUTHERN RHODESIA: Herb. Queen Victoria Memorial 6987 (Rh); V. Vincent 68 [Govt. Herb. Salisbury 39583] (N). BECHUANALAND PROTECTORATE: O. B. Miller B.3 (N, Rh).

VITEX PAYOS var. ZAMBESIACA (J. G. Baker) Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 79. 1942.

Synonymy: Vitex zambesiaca J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 322. 1900. Vitex hildebrandtii var. zambesiaca (Baker) Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 66 & 82. 1928.

Literature: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 322. 1900; Sim, For. Fl. Res. Port. East Afr. 94. 1909; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 66, 82, & 85. 1928; Moldenke, Alph. List Invalid Names 53 & 65. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50, 51, 79, & 104 (1942) and [ed. 2], 121 & 202. 1949.

This variety differs from the typical form of the species in its thinner and only sparsely pubescent peduncles, only about 1 mm. in diameter.

It is a large tree; branchlets stout, angular, densely whitish-pubescent with short hairs; leaves 3--5-foliolate; petioles 7.5--10 cm. long; leaflet-blades thin-textured, green and obscurely pubescent on the upper surface, densely matted-tomentose with whitish hairs beneath when young, more thinly so when mature, sessile, obovate-cuneate, 10—12.5 cm. long, 5--6.3 cm. wide, obtuse at the apex, entire; cymes axillary, many-flowered, long-pedunculate, dense, the branches densely pubescent; calyx campanulate, about 2 mm. long, densely pubescent, its rim toothed, the teeth ovate, acute at the apex; corolla twice as long as the calyx; fruit drupaceous, about the size of a plum, edible.

The type of this variety was collected by Sir John Kirk near the base of Morambala Mountain, Lower Shire, Mozambique, Portuguese East Africa. It was originally described as having only 3-foliolate leaves, but Pieper points out that "Die Angabe, dass die Blätter dreizählig seien, trifft nicht zu. Die Blättchennarben lassen erkennen, dass die Mehrsahl der Blätter fünfzählig ist."

Citations: PORTUGUESE EAST AFRICA: Esselen s.n. [Vila Pery, Aug. '24] (Af, N--photo, Z--photo).

VITEX PEARSONII Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 75. 1928.

Synonymy: Vitex gürkeana H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 217--218. 1901. Vitex guerkeana Pearson apud Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 75, in syn. 1928 [not V. guerkeana Hiern, 1900, nor DeWild., 1909, nor Engl., 1916].

Literature: H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 217--218. 1901; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 53, 75, 82, & 84. 1928; Moldenke, Alph. List Invalid Names 53. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 75. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 121 & 202. 1949.

A small bush; internodes short; leaf-scars prominent; branches densely tawny-pubescent when young; leaves decussate-opposite, 5-foliolate; petioles 5—6.3 cm. long, tawny-pubescent; petiolules 4--12 mm. long, tawny-pubescent; leaflet-blades membranous, ovate, 5—7.5 cm. long, 2--3.3 cm. wide, acuminate or caudate-acuminate at the apex, entire, the acumen obtuse or minutely apiculate, rounded or subcuneate at the base, sparsely puberulent above, tawny-pubescent beneath, profusely glandulose; secondaries 9—12 per side, obscure, slightly prominent beneath; cymes pedunculate, axillary, divaricate, about half as long as the subtending petioles, the branches and bracts tawny-pubescent; flowers short-pedicellate, bracteolate; calyx campanulate, tawny pubescent and glandulose outside, glabrous within, the tube 2--3 mm. long, the limb broadly spreading, 5-lobed, the lobes deltoid, 0.5--1 mm. long, subacute or rounded at the apex; corolla lavender, its tube curvate, about 6 mm. long, glabrous below, puberulent and glandulose on the upper half outside, pubescent within above the insertion of the stamens, the lobes ultimately reflexed, minutely pubescent and villous, profusely glandulose outside, with many multicellular hairs at the base of the anterior lobe within; stamens inserted above the middle of the corolla-tube, long-exserted; filaments densely villous at the base; ovary conic, densely villous and glandulose on the upper half; fruit not known.

The type of this species was collected by Rose Monteiro [Mrs. Joachim John Monteiro, née Bassett] (*no. 20*) at Delagoa Bay, Lourenço Marques, Portuguese East Africa. It is known only from the original collection. Pieper says that from the description it appears to be a member of Subgenus *Holmskioldiopsis*.

VITEX PEDUNCULARIS Wall., Numer. List [48], no. 1753, hyponym (1829); Schau. in A. DC., Prodr. 11: 687. 1847.

Synonymy: *Vitex morava* Buch.-Ham. ex Wall., Numer. List [48], no. 1752, hyponym. 1829. *Vitex pentaphylla* Lamb. ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940 [not *V. pentaphylla* Merr., 1909, nor Pavon, 1940, nor Sessé & Moc., 1940]. *Vitex alata* Wall. ex Moldenke, Alph. List Invalid Names Suppl. 1: 28, in syn. 1947 [not *V. alata* Willd., 1803, nor Heyne, 1821, nor Roxb., 1829, nor Schau., 1885, nor Royen, 1940]. *Vitex procumbens* Hort., in herb.

Literature: Rheede, Hort. Ind. Malab. 5: 1—2, pl. 1. 1685; Roth, Nov. Sp. 316. 1821; Wall., Numer. List [48], nos. 1752 & 1753. 1829; Schau. in A. DC., Prodr. 11: 687. 1847; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 584 & 587. 1885; Hook. f. & Jacks., Ind. Kew. 2: 1213. 1895; Basu, Ind. Medic. Pl. 3: 3, pl.

741. 1918; Ind. Forester 47: pl. 9 & 10. 1921; Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Moldenke, Alph. List Common Names 30. 1939; Moldenke, Suppl. List Common Names 12. 1940; Moldenke, Prelim. Alph. List Invalid Names 49, 51, & 52. 1940; Biswas, Indian Forest Rec. Bot., new ser., 3: 42. 1941; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55, 59, 60, 75, & 104. 1942; Moldenke, Alph. List Invalid Names 52 & 54. 1942; Moldenke, Alph. List Invalid Names Suppl. 1: 28. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 125, 128, 129, 137, 138, 166, & 202. 1949.

Illustrations: Basu, Ind. Medic. Pl. 3: pl. 741. 1918; Ind. Forester 47: pl. 9 & 10. 1921.

Shrub or tree, to 32 m. tall; trunk grayish-brown, to 50 cm. in circumference; bark whitish, dark-brown when cut, the living bark to 4 cm. thick, the dead bark to 1.5 cm. thick; branchlets very slender, grayish, obtusely tetragonal or subterete, medullose, densely puberulent or short-pubescent at the very apex, otherwise glabrous, not noticeably lenticellate; twigs very slender, dark-brown or purplish in drying, minutely and very sparsely strigillose-puberulent or pulverulent, becoming glabrate and shiny in age; nodes annulate, those on the twigs marked with a band of denser puberulence; principal internodes 1.3—9 cm. long; leaf-scars small or rather large, somewhat prominent; leaves decussate-opposite, 3-foliolate, fully expanded during anthesis; petioles very slender, 3.5—7 cm. long, convex beneath, conspicuously flattened and more or less margined (especially at the apex) above, very sparsely and minutely strigillose-puberulent or glabrous in age, slightly ampliate at the base, not disciform at the apex; leaflets subequal, all subsessile or petiolulate on slender, deeply canaliculate and margined petiolules 1--10 mm. long; leaflet-blades subchartaceous, rather uniformly bright-green on both surfaces, the very immature ones brunnescent in drying, the central one oblong, narrow-elliptic, or lanceolate, 7--16 cm. long, 1.8--4.9 cm. wide, acuminate at the apex, entire, acuminate at the base and attenuate into the petiolule, minutely and sparsely pulverulent on both surfaces when young and margined with a band of canescent puberulence, becoming glabrate above in age and very sparsely pulverulent or glabrate beneath, rather densely covered with tiny resinous scale-like punctae beneath even in age, the lateral ones similar in all respects; midrib very slender, flat above, prominent beneath; secondaries very slender, 10--25 per side, numerous and close together, arcuate-ascending, subprominulent on both surfaces, not distinctly joined at the margins; vein and veinlet reticulation rather abundant, very fine, slightly subprominulent on both surfaces (especially above) or obscure beneath; inflorescence axillary, paniculate, solitary or paired in the upper axils, 8--26 cm. long, 3--6 cm. wide, long-pedunculate, composed of 7--11 pairs of opposite or subopposite, long-stipitate, 1--3 times dichotomous, loosely few-flowered cymes; peduncles very slender, 3—9.5 cm. long, mostly slightly flattened, minutely pulverulent-puberulent; cyme-branches elongate, rather densely canescent-puberulent, flattened; foliaceous bracts none; bractlets and prophylla linear, 1--3 mm. long, puberulent; flowers with a slight sweetish odor or not odorous; corolla white, light pink, or yellow.

Kostermans describes the fruit as "green, up to 9 cm. and 5 cm. in diam.", but it seems most probable that this is an error for "mm.", illustrating again one of the most unfortunate aspects of the metric system where the error of a single letter may cause considerable confusion. Common names for the species are "kyetyo" (also applied to V. peduncularis var. roxburghiana), "popoul thmar", and "tin nok" (also applied to V. pinnata L.). It has been collected in clay soil of open forests and scattered in deciduous forests, ascending to 360 meters altitude, blooming in March and April, fruiting in June. Herbarium material has been misidentified as V. alata Roxb., V. heterophylla Roxb., V. heterophylla var. genuina Lam, V. pierriana Dop, V. quinata (Lour.) F. N. Will., and V. sumatrana var. urceolata (C. B. Clarke) King & Gamble. The "Mail-elau" of Rheede, sometimes cited as this species, is V. altissima L. f. Basu's illustration, cited above, shows alate petioles and may actually not belong here either.

The Helfer specimen in the Britton Herbarium has its inflorescences abnormally modified, probably by a fungus.

Citations: INDIA: Sikkim: T. Anderson 938 (Bz--25165). West Bengal: C. B. Clarke 11733j (Bz--24562); Helfer s.n. (N, S); Mukerjee 1502 (S); Rao 5680 (N). BURMA: Upper Burma: Herb. Burma Forest School 14 (N), 38 (N), 47 (Br); Meebold 14948 (S); Prazer 7 (Bz--25127); Ton s.n. [Herb. Burma Forest School 11] (Br); Zan 46 (S). MERGUI ARCHIPELAGO: Tavoy: Mokim 539 (Bz--24560). INDO-CHINA: Annam: Poilane 1336 (Bz--72850); Squires 777 (Bz--24566, Br, N, S), 861 (Bz--24565, N, S). Cambodia: Béjaud 523 (N); Poilane 14937 (Bz--72851, Bz--72852). Cochinchina: Poilane 17320 (Bz--72854); Thorel 1006 (Bz--72853). THAILAND: Bunnak 76 [Herb. Roy. Forest Dept. 9779] (Z); Herb. Roy. Forest Dept. 87 (N); Kostermans 813 (Bz--73304). CULTIVATED: India: Gaudichaud s.n. [hort. Calcutt., 1847] (Du--166535); Herb. Hort. Bot. Calcuttensis s.n. [March, 1888] (Cp), s.n. (Br, Br, Bz--24561, Ed, K, Le, Mu, Mu, N, T, V); Voigt s.n. [H. B. Serampore] (Cp, N--photo, Z-photo); Wallich s.n. [H. B. Calcutt.] (Cp, Cp, N--photo, N--photo, S--photo, Z--photo, Z--photo). LOCALITY OF COLLECTION UNDETERMINED: Herb. Pierre s.n. (S); Roxburgh s.n. (Br).

VITEX PEDUNCULARIS var. ROXBURGHIANA C. B. Clarke in Hook. f.,
Fl. Brit. Ind. 4: 587. 1885.

Synonymy: Vitex alata Roxb. ex Willd. in Rottl., Gesell. Naturforsch. Freunde Berlin, Neue Schriften, 4: 203. 1803 [not V. alata Willd., 1803, nor Heyne, 1821, nor Schau., 1885, nor Royen, 1940, nor Wall., 1947].

Literature: Rheede, Hort. Ind. Malab. 5: pl. 1. 1685; Willd.

in Rottl., Gesell. Naturforsch. Freunde Berlin, Neue Schr. 4: 203. 1803; Roth, Nov. Pl. Sp. 316. 1821; Wall., Numer. List [48], no. 1752. 1829; Roxb., Fl. Ind. 3: 72. 1832; Schau. in A. DC., Prodr. 11: 685. 1847; Dalz. & Gibs., Bombay Fl. 201. 1861; Kurz, For. Fl. Brit. Burma 2: 272. 1877; Gamble, Man. Ind. Timb. 298. 1881; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 587. 1885; Lisboa, Useful Pl. Bombay 201. 1886; Jacks., Ind. Kew. 2: 1213. 1895; Moldenke, Suppl. List Common Names 3, 4, 8, 9, 12, 14--16, & 20. 1940; Moldenke, Prelim. Alph. List Invalid Names 49. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55 & 104. 1942; Moldenke, Alph. List Invalid Names 52. 1942; Moldenke, Phytologia 2: 121. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 79. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 125, 128, 129, & 202. 1949.

This variety is said to differ from the typical form of the species in being less gray-pubescent, in having the petioles winged, and the panicle more laxly few-flowered.

It is based on a specimen collected by Edgeworth at Parasnath, Bihar, and one by Hooker & Thomson from the Khasia Terai, India, another by Hooker & Thomson from East Bengal, Pakistan, and one by Kurz from Pegu, Upper Burma. Clarke states that this is the "V. alata Roxb. Fl. Ind. 3: 72; Wall. Cat. 1752; Kurz, For. Fl. 2: 272, not Heyne nor Schau." He says, further, that Roxburgh quotes for his Chittagong V. alata Rheede Hort. Mal. 5: pl. 1 "which has leaves that might do, but a totally different inflorescence and is Heyne's V. alata."

The variety is said also to be mentioned in Roxb., Fl. Ind., ed. C. B. C., 482, in A. Campbell, Rept. Ec. Pl. Chutia Nagpur, no. 9281, in Aplin, Rep. on the Shan States, and in Gazetteer Mysore & Coorg 1: 43 & 64, but I have not been able to check these references.

The wood is purplish to reddish-gray, heavy, hard, close-grained, and weighing 60 pounds per cubic foot. Common names recorded are "bhadu", "boruna", "goda", "hila auwal", "krawru", "kyetyo", "marak", "navaládi", "osai", and "shelangri". According to Watt this tree occurs in East Bengal, Pakistan, in Upper Burma, and in Bihar, Bombay, Chota Nagpur, and the Khasi States, India.

Campbell reports that in Chota Nagpur the bark is used for making an external medical application in treating pains in the chest. Watt says that the timber is used in Cachar for posts and beams, in the Garo hills for sugarcane crushers, and in Chota Nagpur for yokes. Santapau, in a letter to me dated February 16, 1948, asserts that the "Mahratta country", "Warri jungles", and "Konkan" of Watt are all in Bombay Presidency. The common name "goda" is also applied to Vitex glabrata R. Br.

VITEX PENTADACTYLA Velenovsky, K. Böhm. Gesell. Wiss. Sitzungsb. 1881: 213. 1882.

Literature: Velenovsky, K. Böhm. Gesell. Wiss. Sitzungsb. 1881: 213. 1882; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 42.

1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 166 & 202. 1949.

This is the earliest known fossil in the *Verbenaceae*, coming from the Cretaceous of Bohemia, in rocks about 5,500,000 years old.

VITEX PENTAMERA Engelhardt, Abh. Hess. Geol. Landesanstalt Darmstadt 7 (4): 69, pl. 23, fig. 15. 1922.

Literature: Engelhardt, Abh. Hess. Geol. Landesanstalt Darmstadt 7 (4): 69, pl. 23, fig. 15. 1922; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 42. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 166 & 202. 1949.

Illustrations: Engelhardt, Abh. Hess. Geol. Landesanstalt Darmstadt 7 (4): pl. 23, fig. 15. 1922.

The original description and discussion of this plant are worth repeating here: "Das Blatt ist fingerförmig, Fünfzählig (?), die Blättchen sind länglich, ganzrandig, am Grunde gerundet, vorn spitz, kurz gestielt; der Mittelnerv derselben ist stark und gerade; die Seitennerven entspringen unter spitzen Winkeln, sind fein und bogenlaufig.

"Wir haben ein zusammengesetztes Blatt vor uns, von dessen starkerem Stiele dünnere ausgehen, an welche sich je zwei kurzgestielte Blättchen anschliefen. Das unvollstang erhaltene seitwarts liegende dürfte wohl abgebrochen sein und an dem verdickten Ende des Blattstieles gestanden haben. Ist diesder Fall, so hatten wir ein fünfzähliges Blatt vor uns, das grosze Aehnlichkeit mit solchen einiger *Vitex*-Arten z.B. *V. montevidensis* Cham. & Schl. besasze, weshalb ich es vorläufig, bis uns bessere Stücke völlige Klarheit verschaffen, in diese Gattung einreihe.

"Ausdrücklich sei noch auf die grosze Aehnlichkeit mit den Blättern von *Dewalquea gelindenensis* Sap. et Mar. (Gelinden Taf. 9) hingewiesen, die wohl in der Stellung der Blättchen mit unserem Blatte übereinstimmen, nicht aber in deren Form, da sie sich nach dem Grunde keilförmig verschalern, vorn aber spitz und ausgerandet sind."

VITEX PERRIERI Danguy, Bull. Hist. Nat. Paris 30: 508--509. 1924.

Literature: Danguy, Bull. Hirt. Nat. Paris 30: 508--509. 1924; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 75, 78, & 84. 1928; Hill, Ind. Kew. Suppl. 7: 252. 1929; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104. 1942: H. N, & A. L. Moldenke, Plant Life 2: 75. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123 & 202. 1949.

Shrub or small tree; branchlets medium-stout, obtusely tetragonal, densely appressed-tomentose (not villous as stated by Danguy) when young, glabrescent in age, gray; twigs more slender, plainly tetragonal or flattened, very densely appressed-tomentose or tomentellous with pale flavescent hairs; nodes not annulate; principal internodes 1.5--4.5 cm. long; buds densely flavescent-villous; leaf-scars rather large, not very prominent;

leaves decussate-opposite, 5-foliolate; petioles stoutish, 3.5--8 cm. long, very densely flavescent-tomentose; petiolules conspicuous, the central one 1--3 cm. long, densely flavescent- or brownish-tomentellous, the lateral ones 1--12 mm. long; leaflet-blades chartaceous, rather uniformly bright-green on both surfaces, elliptic (not oblong as stated by Danguy), 3--12 cm. long, 2--8 cm. wide, acite or obtuse (rarely rounded) at the apex, entire, rounded or subtruncate at the base, rarely acute, rather densely pubescent on both surfaces, subvillosulous on the larger veins beneath; midrib slender, flat and usually densely villous above, prominent beneath; secondaries slender, 8--12 per side, ascending, flat above, prominulous beneath, anastomosing in many small loops at the very margins beneath; veinlet reticulation abundant, slightly subimpressed above, prominulous beneath; inflorescence axillary, the cymes few-flowered, dichotomous, bracteate, shorter than the subtending petioles; peduncles comparatively stout, 1.5--2 cm. long, very densely flavescent-tomentose; bractlets linear, 5--10 mm. long, with the inflorescence-branches very densely flavescent-tomentose; flowers sessile; calyx campanulate, thick-textured, 9--12 mm. long, 5--8 mm. wide, 10-costate with very prominent ribs, densely canescent villous or flavescent-tomentose on the outside, long-pilose within; corolla reddish, tubular, the tube slightly incurved, 1.5--1.8 cm. long, very densely appressed-villous or lanuginous with whitish antrorse hairs on the outside, villous at the base within, glabrous at the apex within, the limb 5-lobed, the lobes slightly unequal, about 3 mm. long, the posterior ones larger and broader, the anterior one longer and tongue-shaped; stamens 4 (or 3?), exserted, glabrous, about 1.8 cm. long; filaments green, inserted at the lower part of the corolla-tube, villous at the base; anthers small, 2-celled, introrse; pistil glabrous; ovary globose, with 4 ovules; style filiform, 2--2.2 cm. long, bifid at the apex; fruiting-calyx enlarged, campanulate, about 15 mm. long and wide, very densely flavescent-tomentellous, venose but not costate, rather deeply and irregularly lobed; fruit ovoid, shiny, 1.5--1.5 cm. long, glabrous, 4-celled, enclosed by the mature calyx.

The type of this species was collected by Joseph Marie Henri Alfred Perrier de la Bâthie (*no. 373*) at Tsarasaotra, Madagascar, in November, 1897, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. It is known from sandy plateaus, 30--120 meters altitude, blooming in November, and fruiting in February.

Citations: MADAGASCAR: *Perrier de la Bâthie 373* (N--isotype, N--photo of type, P--type, P--isotype, Z--photo of type); *Service Forestiere 7* (P), *99* (N, P).

VITEX PERVILLEI J. G. Baker, Fl. Maurit. & Seych. 256. 1877.

Literature: J. G. Baker, Fl. Maurit. & Seych. 256. 1877; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 75, 78, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 75. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123 & 202.1949.

Shrub, 1--4 m. tall; stems much branched, glabrous; branches and branchlets slender, gray, glabrous, twiggy, irregular, not lenticellate; nodes not annulate; principal internodes 0.5--4.5 cm. long, often very much abbreviated on twigs; leaf-scars somewhat prominent on twigs, less so on older wood; leaves decussate opposite, 3-foliolate; petioles very slender, 1.7--3 cm. long, glabrous; petiolules filiform, mostly very short, the lateral ones mostly 1--2 mm. long, the central one sometimes to 15 mm. long, glabrous; leaflet-blades very thin-membranous and fragile when immature (during anthesis), firmly chartaceous or "subcoriaceous" (according to Baker) when mature (during fructescence), elliptic or lanceolate (not "oblong" as stated by Baker), 2.5--9 cm. long, 1.2--3.7 cm. wide, gradually narrowed from the middle or below the middle to a rather obtuse apex, acute or acuminate, entire (or sometimes coarsely dentate-lobed on sprouts), acute or acuminate (not "cuneate-spatulate" as stated by Baker) at the base, uniformly green and glabrous on both surfaces, somewhat brunnescent in drying when immature; midrib slender, sharply prominulous above and prominent beneath; secondaries very slender, 5--10 per side, conspicuously prominulous on both surfaces on mature leaves, arcuate-ascending, joined in broad loops 1--2 mm. from the margins; veinlet reticulation abundant, conspicuously prominulous above on mature leaves, slightly less so beneath; inflorescence axillary and terminal, short-pedunculate, rather few-flowered, simple or paniculate, shorter than the subtending leaves, brunnescent in drying; peduncles slender, 1--1.7 cm. long, glabrous, flattened; bractlets linear, 1--3 mm. long, glabrous; pedicels filiform, 1--2 mm. long, glabrous or very minutely and microscopically pilosulous, incrassate at the apex in age; calyx campanulate, about 2 mm. long and wide, glabrous or microscopically pilosulous toward the apex, brunnescent in drying, its rim 5-dentate, the teeth very short, triangular-ovate, acute, 0.5 mm. long or less; corolla white, its tube cylindric, about 3 mm. long, straight, glabrous, its limb 4--5 mm. wide; stamens and style short-exserted; fruiting-pedicels to 1 cm. long, glabrous; fruiting-calyx incrassate, shallowly cupuliform or broadly campanulate, to 5 mm. long and 8 mm. wide, its rim very shallowly and obscurely dentate, glabrous; fruit drupaceous, obovate-elliptic, 1--1.3 cm. long, 5--10 mm. wide, glabrous.

The species is based on two collections of Auguste Pervillé, no. 636 from the Seychelles, and no. 870 bis from the northeastern part of Madagascar, collected in 1841. A vernacular name is "hofaty". It has been collected in anthesis in April, November, and December, in sandy places on a plateau at 100--150 meters altitude. A label says "0.25 diam.", but it is not clear if this means "m." or "cm." and if it applies to the stem or not.

Citations: SEYCHELLES ISLANDS: Pervillé 636 (K--cotype, N--cotype, N--photo of cotype, P--cotype, Z--photo of cotype). MADAGASCAR: Boivin s.n. [Madagascar, 1847--1852] (P); Perrier de la Bâthie 1170 (P), 1181 (N, P), 17307 (P); Pervillé 870 bis (K--

cotype, N—photo of cotype, Z--photo of cotype); Richard s.n. [Ambongo, comm. 1846] (P); Service Forestier 29 (N, P), 53 (P).

VITEX PERVILLEI var. PUBESCENS Moldenke, Phytologia 3: 444--445. 1951.

This variety differs from the typical form of the species in having its young twigs, petioles, petiolules, both surfaces of the leaflet-blades, peduncles, cyme-branches, pedicels, bractlets, and calyxes densely puberulent, and the lower leaflet-surface densely resinous-punctate.

The type of the variety was collected by my good friend and colleague, Dr. Henri Humbert (no. 3019) among siliceous rocks on rocky slopes, altitude 800--1000 meters, in the valley of Ihosy, basin of the Mangoky, Madagascar, on October 29 or 30, 1924, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. The same collector's no. 2999 is accompanied by a long description in French of the flowers, ovary, etc., and by line drawings.

Citations: MADAGASCAR: Humbert 2999 (P), 3019 (N--isotype, N-photo of type, P--type, P--isotype, Z--photo of type).

VITEX PETERSIANA Klotzsch in Peters, Naturwiss. Reise Mossamb. Bot. 264. 1862.

Synonymy: Vitex kirkii J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 321. 1900.

Literature: Klotzsch in Peters, Naturwiss. Reise Mossamb. Bot. 264. 1862; Gürke in Engl., Pflanzenw. Ost-Afr. C: 340. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 315 & 320--321. 1900; Sim, For. Fl. & Res. Port. East Afr. 94. 1909; Eyles, Trans. Royal Soc. South Afr. 5: 459. 1916; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 44, 57--58, 83, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 104. 1942; Moldenke, Alph. List Invalid Names 53. 1942; H. N. & A. L. Moldenke, Plant Life 2: 66 & 76. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 119, 121, & 202. 1949; Wild, Vict. Falls Handb. 131 & 158. 1953; Wild, South. Rhodes. Bot. Dict. 138. 1954.

Spreading bush or shrub, 2 m. tall, or small tree; branchlets finely gray-pubescent; leaves 3-foliolate; petioles short, less than 2.5 cm. long; leaflet-blades moderately firm in texture, oblong or ovate, obtuse or acute at the apex, entire or incised-serrate, bright-green and glabrous above, paler and pubescent beneath, the central one 2.5—4 cm. long; cymes axillary, often 2 or 3 at the apex of the branchlets, very lax-flowered, with a solitary flower in the axil of each furcation; peduncles short, pubescent; pedicels short, pubescent; bractlets linear, small or minute, villous; calyx campanulate or cyathiform, about 2 mm. long, pubescent, its rim 5-dentate, the teeth minute, deltoid; corolla blue in bud, pink when open, about 1.2 cm. long, pubescent, the tube twice as long as the calyx, the lower lip much longer than the upper lip; fruit drupaceous, globose, about the size of a large pea (Pisum sativum).

The type of this species was collected by Wilhelm Carl Hartwig

Peters at Tette, on the lower Zambesi River in Mozambique, Portuguese East Africa. *V. kirkii* is based on an unnumbered collection from the same place by Sir John Kirk in 1861 and on *Menyharth 872* from Boruma in northern Zambesia, Rhodesia. To these Pieper adds an unnumbered Allen collection from Victoria Falls, and Wild adds *Allen 60* and *Rogers 5377* and *5828* from the same place. A common name for the species is "umfulikolio". It has been collected in anthesis in November and December.

Baker distinguishes *V. kirkii* from *V. petersiana* by stating that in the former the leaflet-blades are oblong, while in the latter they are ovate. Pieper states that this character does not hold. He adds "Lediglich die Tatsache, dass die jüngeren Triebe bei *Kirkii* reicher entwickelt sind, kann ebenfalls zur Unterscheidung der beiden Arten nicht massgebend sein."

Citations: NORTHERN RHODESIA: *A. A. Pardy s.n.* (N, Rh--4755); *Wild 3195* (N, Rh--26368).

VITEX PETERSIANA var. TETTENSIS (Klotzsch) Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 58. 1928.

Synonymy: *Vitex tettensis* Klotzsch in Peters, Naturwiss. Reise Mossamb. Bot. 264. 1862.

Literature: Klotzsch in Peters, Naturwiss. Reise Mossamb. Bot. 264. 1862; Gürke in Engl., Pflanzenw. Ost-Afr. C: 340. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 315 & 320. 1900; Sim, For. Fl. & Res. Port. East Afr. 94. 1909; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 58 & 84. 1928; Moldenke, Alph. List Invalid Names 55. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104 (1942) and [ed. 2], 121 & 202. 1949.

This variety differs from the typical form of the species in having its pubescence much more sparse on all its parts, especially on the calyx. The pubescence is also said to be pale-brown instead of gray, the leaflet-blades are short-cuspidate at the apex, 2--2.5 cm. long, glabrous above, pubescent on the secondaries beneath, the cymes few-flowered, calyx cyathiform, 4- or 5-toothed, and the corolla-tube cylindric, sparsely pubescent on the outside.

The variety is based on an unnumbered collection made by Peters at Tette, on the lower Zambesi River in Mozambique, Portuguese East Africa. It is known only from the original collection.

VITEX PHAEOTRICHA Mildbr. ex Pieper in Fedde, Repert. 26: 163. 1929.

Synonymy: *Vitex phaestricha* Mildbr. ex Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 45, 58, & 84, hyponym. 1928.

Literature: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 45, 58, & 84. 1928; Pieper in Fedde, Repert. 26: 163. 1929; Hill, Ind. Kew. Suppl. 8: 249. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 202. 1949.

Tall tree; young branches fuscous-villous; leaves 5-foliolate; petioles 5--9 cm. long; leaflets subsessile, the blades obovate, obtuse and very shortly apiculate at the apex, cuneate at the base, many-nerved, hirsute above, villous beneath, densely fuscous-pilose with appressed hairs on the venation on both surfaces, especially beneath; inflorescence axillary, elongate, conspicuously branched, fuscous-villous; peduncles equaling the subtending petioles; bractlets filiform, about 5 mm. long; flowers small, to 5 mm. long; calyx campanulate, about 2 mm. long, fuscous-hirsute outside, the rim distinctly and regularly 5-dentate; corolla slightly curvate, the tube covered with sessile glands on the outer surface, the lobes fuscous-hirsute outside; filaments glandular-pilose, barbate at the base; ovary globose, glandulose at the apex; fruiting-calyx and fruit not known.

The type of this species was collected by Günther Tessmann (*no. 376*) on the campo along the way to Alen, Cameroons, and is deposited in the herbarium of the Botanisches Museum at Berlin. An additional collection cited by Pieper is *Zenker 4191*, collected in the primeval forest at Bipinde, Cameroons.

VITEX PHASEOLIFOLIA Mildbr., Wiss. Ergebn. Zent. Afr. Exped. 1910/1911 2: 80, hyponym. 1922; Pieper in Fedde, Repert. 26: 161. 1929.

Synonymy: *Vitex agelaeifolia* Mildbr., Wiss. Ergebn. Zent. Afr. Exped. 1910/1911 2: 30, hyponym. 1922 [not *V. agelaeifolia* Mildbr., 1928].

Literature: Mildbr., Wiss. Ergebn. Zent. Afr. Exped. 1910/1911 2: 30 & 80. 1922; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 42, 55, & 84. 1928; DeWild., Pl. Bequaert. 5: 20. 1929; Pieper in Fedde, Repert. 26: 161. 1929; Hill, Ind. Kew. Suppl. 8: 249. 1933; Moldenke, Alph. List Invalid Names 51. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48, 102, & 104 (1942) and [ed. 2], 114, 200, & 202. 1949.

Shrub; brabchlets tetragonal, glabrous; leaves 3-foliolate; petioles 4--8 cm. long, glabrous or subglabrous; leaflet-blades glabrous or subglabrous, entire or subentire, the central one obovate-elliptic, acuminate at the apex, the lateral ones obliquely elliptic, 6--10 cm. long, 3--6 cm. wide, acuminate at the apex, subcordate at the base; central petiolule about 4 mm. long, the lateral ones very short; secondaries 3 or 4 per side; inflorescence axillary, paniculate, the lateral branches congested, spiciform, short-pubescent; pedicels 1--2 mm. long; bracts subulate, caducous; uppermost bractlets minute, navicular, obtuse; calyx cyathiform, about 3 mm. long, sparsely glandulose and puberulent on the outside, its rim truncate, regularly denticulate and ciliate; corolla conspicuously geniculate, somewhat more than twice the length of the calyx, glandulose on the outside, the upper lip plainly 2-lobed; style inserted below the apex of the ovary, arcuate; ovary globose or conic, truncate, glabrous; fruiting-calyx patelliform; fruit small, drupaceous, about 1 cm. in diameter.

The type of this species was collected by Gottfried Wilhelm Johannes Mildbraed (*no. 7623*) in cleared land in front of Ebolowa Station, southern Cameroons. The type of *V.agelaeifolia*

(1922, not 1928) is Mildbraed 5452 from large Dscha-Bogen, Kongulu, Lomie, southern Cameroons. Both types are deposited in the herbarium of the Botanisches Museum at Berlin. Pieper refers to both binomials as "nom. sol.", but inasmuch as definite specimens are cited in each case, they are actually hyponyms, not nomina nuda.

Pieper describes the fruit as baccate, but in this genus it is actually uniformly drupaceous.

VITEX PHILLYREAEFOLIA J. G. Baker, Journ. Linn. Soc. Lond. Bot. 20: 226--227. 1883.

Literature: J. G. Baker, Journ. Linn. Soc. Lond. Bot. 20: 226--227. 1883; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 76, 79, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104 (1942) and [ed. 2], 123 & 202. 1949.

A much-branched erect shrub; branches and branchlets slender, gray, very obtusely tetragonal, very twiggy, glabrous; twigs very slender, short, straight, ascending, obtusely tetragonal, densely appressed-villous with brown antrorse hairs toward the apex, deciduous in age; nodes not annulate; principal internodes 0.5--4.5 cm. long; leaves decussate-opposite, numerous, 1-foliolate; petioles slender, 2--10 mm. long, jointed at the apex, flattened and canaliculate above, densely brown-villous with antrorsely appressed hairs when young, glabrescent in age; blades firmly chartaceous, dark-green above, lighter beneath, shiny on both surfaces, glabrous but not smooth-appearing on both surfaces, elliptic, 2--5 cm. long, 1--2.5 cm. wide, usually very obtuse or even emarginate at the apex, acute or deltoid at the base, entire, sometimes slightly emarginate at the apex in drying; midrib slender, impressed above, prominulous beneath; secondaries and veinlet reticulation indiscernible on both surfaces; flowers solitary, nearly sessile in the axils of the upper leaves; bractlets broad, ovate, about twice as long as wide; calyx about 6 mm. long, shaggy-villous with brown silky hairs, the teeth not more than 1/4 as long as the tube, mostly 0.5--1 mm. long; corolla reddish, curvate, about 2.5 cm. long, densely long-pilose or villous with fulvous hairs, the tube about 2 mm. wide at the base and 5 mm. wide at the apex, the limb with its lobes about 2 mm. long, densely antrorsely villous like the tube; stamens and style included in the corolla-tube; ovary densely hairy.

The type of this endemic species was collected by Richard Baron (no. 1446) between Tankay and the east coast, Madagascar, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. It is known only from the original collection.

Citations: MADAGASCAR: Baron 1446 (K--type, N--isotype, N--photo of type, P--isotype, Z--photo of type).

VITEX PIERREANA Dop, Bull. Soc. Hist. Nat. Toulouse 57: 205. 1928.

Literature: Dop, Bull. Soc. Hist. Nat. Toulouse 57: 205. 1928; Hill, Ind. Kew. Suppl. 9: 297. 1933; Merr. & Metcalf, Lingnan Sci. Journ. 16: 399. 1937; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 58, 59, & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 76. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 135, 137, & 202. 1949.

An erect shrub or tree, to 18 m. tall; trunk 9--30 cm. in diameter; branches gray or grayish-black; bark grayish-yellow, brownish-gray, or gray, rimose; branchlets slightly pubescent or subglabrous; leaves 3-foliolate; petioles 4--5 cm. long, canaliculate, glabrescent; leaflet-blades chartaceous, ovate or ovate-elliptic, acute or acuminate at the apex, entire, obtuse or acute at the base, glabrous and glandulose on both surfaces but pubescent on the venation, the central one 9--10 cm. long, 3--4 cm. wide, the lateral ones smaller; secondaries 14--20, slender, recurved; tertiaries subparallel, regular; veinlet reticulation conspicuous; petiolules of central leaflet 1--2 cm. long, of lateral leaflets about 1 cm. long; inflorescence paniculate, terminal, lax, pyramidal, broad, foliose at the base, pubescent, the cymules di- or trichotomous, corymbiform, divaricate; peduncles 1--2 cm. long; bracts and bractlets none or else minute and caducous; pedicels capillary, 5--8 mm. long; flowers about 8 mm. long; calyx conic, about 2.6 mm. long, pubescent and glandulose on the outside, the rim subtruncate, the teeth 5, very short and acute; corolla whitish-yellow or blue, pubescent and glandular on the outside, its tube about 4 mm. long, villous at the insertion of the stamens within, the upper lip 2-lobed, the lobes about 2 mm. long and glabrous, the lower lip 3-lobed, glabrous inside, the middle lobe about 3 mm. long; stamens scarcely exserted, incurved; filaments villous at the base; anthers black; style equaling the stamens; stigma 2-lobed; ovary glabrous, glandulose at the apex; fruit torus creamy-white; fruit green or pale-green when immature, black when ripe; seeds black.

The species is based on Pierre 273 and 310 from Tay Ninh and Cay Cong, Cochinchina, Indochina. The species is said to be fairly common in dry sandy soil of thickets and dry steep slopes, in woods or mixed woods, forests, in partial shade of forested ravines, along streams, scattered in moist loam along roadsides, and on dry gentle slopes, ascending to 800 feet altitude. It has been collected in anthesis in March and April, and in fruit from June to August. Its wood is used for making pillars, according to Lau. It has been confused in herbaria with V. quinata (Lour.) F. N. Will., but differs in having numerous, straight, parallel, close together secondaries. It is related to V. eberhardtii Dop, but differs in its inflorescence, pubescent calyx, and smaller flowers.

Citations: HAINAN ISLAND: How 70570 (N, S), 70858 (N, S); Lau 16 (N), 1584 (N), 3649 (S), 3385 (S); Liang 62220 (N); C. Wang 32892 (N), 33204 (N), 33757 (N). INDOCHINA: Cochinchina: Pierre s.n. [3/5/1866] (N, S).

VITEX PIERREI Craib, Kew Bull. 1918: 367--368. 1918.

Literature: Craib, Kew Bull. 1918: 367--368. 1918; Hill, Ind.

Kew. Suppl. 6: 219. 1926; Dop in Lecomte, Fl. Gén. Indo-chine 4: 811 & 848. 1935; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 59, 60, & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 76. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 137, 138, & 202. 1949.

Illustrations: Dop in Lecomte, Fl. Gén. Indo-chine 4: 811 & 848. 1935.

Young branchlets tetragonal or eventually terete, densely soft-pubescwnt, eventually more or less glabrescent; bark gray-brown; lenticels numerous but not conspicuous; leaves 5-foliolate; petioles 3--7 cm. long, densely soft-pubescent; leaflet-blades chartaceous, varying from ovate or oblong to oblanceolate-obovate or obovate, acuminate or caudate at the apex with an acute acumen, entire or irregularly few-serrate along the margins, to 7.5 cm. long and 3.8 cm. wide, cuneate or broadly cuneately attenuate into the petiolule at the base, sparsely pilose above with white bulbous-based hairs, more densely so toward the margins, soft-pubescwnt beneath especially on the midrib and larger veins and also yellowish-glandulose, the central one largest, the 2 lowest ones small and often caducous; secondaries 8--10 per side, conspicuous above, prominulous beneath; petiolules to 2 cm. long, soft-pubescent; inflorescence similar to that of *V. canescens* except that the pedicels are shorter and the rachis soft-pubescent and golden-glandulose; bracts small, caducous; pedicels at time of anthesis about 1 mm. long; calyx 3--5 mm. long, appressed-hirsutulous and golden-glandulose, with a few appressed setae within toward the apex, the lobes subequal, deltoid, about 0.75 mm. long, acute or obtuse at the apex, ciliate; corolla in bud short-pubescent and golden-glandulose outside, in anthesis about 7 mm. long, the basal part of the tube cylindric and about 2 mm. long, the upper lip 2 mm. long, 2-lobed to the middle, the lobes scarcely 1 mm. long and 1.5 mm. wide, rounded at the apex, the lower lip 3-lobed, the middle lobe about 2.75 mm. long, larger than the 2 lateral ones; stamens exserted; filaments papillose at the base; style subequaling the longer filaments; stigma bifid; ovary about 1 mm. long, densely glandulose at the apex.

The species is based on *Pierre 1839* from Cochinchina and on *Mrs. D. J. Collins 72* from *Sriracha*, altitude 4.5 meters, Cochinchina.

Citations: INDOCHINA: Cochinchina: *Pierre 5218* (F--photo, N, N--photo, S, S, Sg--photo, Z--photo).

VITEX PINNATA L., Sp. Pl., ed. 1, 638. 1753 [not *V. pinnata* Lour., 1847].

Synonymy: *Katoú-mail-eloú* Rheede, Hort. Ind. Malab. 5: 3--4, pl. 2. 1685. *Pistacio-Vitex* L., Fl. Zeyl., ed. 1, 195. 1747. *Anonyma* Herm. ex L., Fl. Zeyl., ed. 1, 195, in syn. 1747. *Vitex latifolia* Lam., Encycl. Méth. Bot. 2: 613. 1788 [not *V. latifolia* Mill., 1768, nor Blanco, 1837, nor Wight, 1840]. *Vitex negundo* Noronga, Verh. Batav. Gen. 5, ed. 1, art. 4: 86. 1790 [not *V. negundo* L., 1753]. *Vitex pubescens* Vahl, Symb. Bot. 3: 85. 1794 [not *V. pubescens* Heyne, 1829]. *Vitex arborea* Roxb., Hort. Beng. 46, hyponym. 1814; Fl. Ind. 3: 73. 1832. *Wallrothia articulata* Roth, Nov. Pl. Sp. 317. 1821. *Vitex articulata* Steud., Nom. Bot., ed. 2, 2: 777. 1840. *Vitex digitata* Wight ex Steud., Nom. Bot., ed. 2, 2: 777. 1840. *Vitex bracteata* Horsf. ex Miq., Fl. Ind. Bat. 2: 862. 1858. *Vitex heterophylla* Blume ex Miq., Fl. Ind. Bat. 2: 862. 1858 [not *V. heterophylla* Roxb., 1814, nor Williams, 1905, nor Schau., 1919]. *Vitex inaequifolia* Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 223. 1863. *Vitex pubescens* var. *lilacina* Kuntze, Rev. Gen. Pl. 2: 511. 1891. *Vitex pubescens* var. *bicolor* Kuntze, Rev. Gen. Pl. 2: 511. 1891. *Pistacia vitex* L. ex Watt, Dict. Econom. Prod. Ind. 6 (4): 250, in syn. 1893. *Vitex inaequiolia* Turcz. ex Lam & Bakh., Bull. Jard. Bot. Buitenz., sér. 3, 3: 53, in syn. sphalm. 1921. *Vitex pubescens* var. *ptilota* Dop, Bull. Soc. Hist. Nat. Toulouse 59: 198. 1928. *Pistacia vitex* Steud. ex Zohary, Palest. Journ. Bot., Jerus. ser., 5: 227, in syn. 1952. *Vitex latifolia* Vahl, in herb.

Literature: Rheede, Hort. Ind. Malab. 5: 3--4, pl. 2. 1685; L., Fl. Zeyl., ed. 1, 195. 1747; L., Fl. Zeyl., ed. 2, 195. 1748; L., Sp. Pl., ed. 1, 638. 1753; N. L. Burman, Fl. Ind. pl. 43. 1768; West., Univ. Bot. 1: 312. 1770; Lam., Encycl. Méth. Bot. 2: 613. 1788; Noronha, Verh. Batav. Gen. 5, ed. 1, art. 4: 86. 1790; Vahl, Symb. Bot. 3: 85. 1794; Roxb., Hort. Beng. 46. 1814; Roxb., Fl. Ind., ed. 1, 482. 1820; Roth, Nov. Pl. Sp. 317. 1821; Blume, Bijdr. 14: 812. 1826; Wall., Numer. List [48], no. 1747. 1829; Roxb., Fl. Ind., ed. Carey, 3: 73. 1832; Decne., Nouv. Ann. Mus. Nat. Paris 3: 401. 1834; Blanco, Fl. Filip., ed. 1, 514. 1837; Steud., Nom. Bot., ed. 2, 2: 777. 1840; Spanoghe, Linnaea 15: 330. 1841; Zoll. & Moritzi, Syst. Verz. 53. 1845--1846; Schau. in A. DC., Prodr. 11: 685 & 696. 1847; Wight, Icon. Pl. Ind. Or. 4: pl. 1465. 1849; Miq., Fl. Ind. Bat. 2: 861--862. 1858; Drury, Useful Pl. India 443. 1858; W. Elliot, Fl. Andhr. 32 & 124. 1859; Mason, Burmah & its People, ed. 2, 526 & 792. 1860; Miq., Fl. Ind. Bat. Suppl. 1: 242. 1860; Hassk., Hort. Malab. Clav. 38. 1862; Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 223. 1863; Kurz, For. Fl. Brit. Burma 2: 271. 1877; Ind. Forester 3: 204. 1877; Blanco, Fl. Filip., ed. 3, 2: pl. 427. 1878; Gamble, Man. Ind. Timb. 297. 1881; Vidal, Sin. Fam. & Gen. Pl. Leñ. Filip. [Introd. Fl. For. Filip.] Atlas pl. 75, fig. A. 1883; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 585. 1885; Hemsl., Rep. Scient. Res. Voy. Challenger Bot. 1: 110 & 178. 1885; Kuntze, Rev. Gen. Pl. 2: 511. 1891; Schimper, Bot. Mitteil. Trop. 3: 129. 1891; Watt, Dict. Econom. Prod. Ind. 6 (4): 250. 1893; Jacks., Ind. Kew. 2: 1214. 1895; Koord. & Val., Bijdr. Booms. Java 7: 202. 1900; E. D. Merr., Bur. Gov. Lab. Philipp. Bull. 27: 68. 1905; King & Gamble, Journ. As. Soc. Beng. 74: 848. 1909; Koord., Pl. Jungh. 4: 188. 1910; Tectona 4: 393. 1911; Docters van Leeuwen, Bull. Jard. Bot. Buitenz., sér. 2, 3: 49. 1912; Koord., Exkurs. Fl. Java 3: 136. 1912; Elbert, Meded. Rijks Herb. Leiden 12: 16. 1912; Koord. & Val., Atlas Baumart. Java pl. 294 & 295. 1914; Heyne, Nutt. Plant. Nederl. Ind., ed. 1, 4: 114. 1917; H. Hallier, Meded. Rijks Herb. Leiden 37: 44. 1918; H. J. Lam, Verbenac. Malay. Arch. 166, 167, 183--185, & 370. 1919; Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 53. 1921; Bakh. & Lam, Bull. Jard. Bot. Buitenz., ser. 3, 4 (2): 285. 1922; Docters van Leeuwen, Bull. Jard. Bot. Buitenz., ser.3,4:311 & 314. 1922; H. J. Lam, Bull. Jard. Bot. Buitenz., ser. 3, 5 (2): 178. 1922; E. D. Merr., Enum. Philipp. Pl. 3: 396. 1923; Heyne, Nutt. Plant. Nederl. Ind., ed. 2, 1317--1318. 1927; Foxworthy, Malayan Forest Rec. 3: 163. 1927; Dop, Trav. Lab. For. Toulouse 1 (1): pl. 2. 1928; Dop, Bull. Soc. Hist. Nat. Toulouse 59: 198. 1928; Uittien, Rec. Trav. Bot. Néerl. 25: pl. 8. 1929; Bull. Jard. Bot. Buitenz., ser. 3, 13: 28. 1930; Stapf, Ind. Lond. 6: 479. 1931; Van Steenis, Bull. Jard. Bot. Buitenz., ser. 3, 13: 28. 1933; Crevost & Pételot, Bull. Econom. Indo-Chine 37: 1294. 1934; Moldenke, Alph. List Common Names 1, 2, 18, 21, 22, 27, & 30. 1939; Moldenke, Geogr. Distrib. Avicenn. 21 & 40. 1939; Moldenke, Suppl. List Common Names 2, 4, 6--16, 18, 22, & 23. 1940; Moldenke, Prelim. Alph. List Invalid Names 5, 36, 50--52, & 54. 1940; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Alph. List Invalid Names 4, 36, 52--54, & 57. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 33, 55, 56, 59, 61, 63--66, 75, & 104. 1942; Moldenke, Phytologia 2: 121. 1944; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mexico 20: 15. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 67, 125, 128--130, 137, 139, 140, 142--148, 166, & 202. 1949; Zohary, Palest. Journ. Bot., Jerus. ser., 5: 227. 1952.

Illustrations: Rheede, Hort. Ind. Malab. 5: pl. 2. 1685; N. L. Burman, Fl. Ind. pl. 43. 1768; Wight, Icon. Pl. Ind. Or. 4: pl. 1465. 1849; Blanco, Fl. Filip. pl. 427 (colored). 1878; Vidal, Sin. Fam. & Gen. Pl. Leñ. Filip. [Introd. Fl. For. Filip.] Atlas pl. 75, fig. A. 1883; Koord. & Val., Atlas Baumart. Java pl. 294 & 295. 1914; Foxworthy, Malayan Forest Rec. 3: 163. 1927; Dop, Trav. Lab. For. Toulouse 1 (1): pl. 2. 1928; Uittien, Rec. Trav. Bot. Néerl. 25: pl. 8. 1929.

Small or medium-sized tree, to 25 m. tall; trunk to 70 cm. in diameter at the base and to 45 cm. in diameter at 10--15 m. height, wadded toward the base, more or less crooked; main branches issuing from at or below the middle of the tree, suberect or ascending, crookedly rebranched and wide-spreading toward the top; crown to 6 m. wide; branchlets ascending, greenish when fresh, gray on herbarium specimens, slender or stoutish, angular or acutely to obtusely tetragonal, slightly ampliate at the nodes, densely short-puberulent; twigs rather slender or coarse, chestnut- or buff-colored, obtusely or acutely tetragonal, horizontally spreading, with ascending curved tips, often sulcate on the younger parts, densely short-puberulent with brownish or sordid hairs; wood tasteless or bitterish, odorless, smooth, yellowish-white or gray with an olive-brown tinge, the sapwood dingy-white or gray, the central older portions varying from olivaceous or chocolate to brownish or nearly black, very coarse-grained and hard, brittle, heavy, weighing 55 pounds per cubic foot; bark varying from grayish or yellowish-gray to brown, about 1 cm. thick, smooth or minutely checked longitudinally, defoliating in thin pieces, chestnut-colored except for the epidermis, the inner portions yellow; nodes obscurely or not at all annulate, mostly somewhat ampliate and corky; principal internodes 1--7.5 cm. long; leaves horizontally spreading, decussate-opposite, normally 3--5-foliolate (1- or 2-foliolate on seedlings); petioles yellowish-green, slender or stoutish, 4--10.5 cm. long, convex beneath, flattened and submargined above, densely short-puberulent, not noticeably ampliate at the base nor disciform at the apex; leaflets mostly unequal in size, often descending and recurved on the tree, the lower ones often much reduced, all petiolulate on rather slender, puberulent, deeply canaliculate and margined petiolules 1--6 mm. long, or the lowest ones sessile or subsessile; leaflet-blades firmly chartaceous or submembranous, rather thick and firm when mature, rather uniformly dark-green on both surfaces or somewhat lighter beneath, sometimes shallowly incurved or infolded on the tree, the central one elliptic or ovate, 8--22.5 cm. long, 3.5--10.5 cm. wide, acuminate or subcaudate at the apex, entire (the lowest ones often serrate-dentate on seedlings), broadly cuneate or acute at the base, somewhat attenuate, minutely and obscurely pulverulent-puberulent above along the midrib and sometimes also along the secondaries and on the lamina, more densely puberulent or short-pubescent beneath, especially on the larger venation, on petiolules to 6 mm. long, the two lateral ones similar but usually smaller and more acute at the apex, 5.5--15.5 cm. long, 2.5--7 cm. wide, and on petiolules only to 2 mm. long, the 2 lowest (when present) 1.5--5.2 cm. long, 0.7--2.3 cm. wide, and sessile or subsessile; midrib slender, yellowish-green when fresh, flat or subprominulent above, prominent beneath; secondaries slender, 8--20 per side, yellowish-green when fresh, flat above, prominent beneath; vein and veinlet reticulation abundant, fine, obscure or subprominulent above, prominulent beneath, the tertiaries rather straight and parallel; inflorescence terminal, erect, sometimes axillary in the uppermost leaf-axils, thyrsoid-paniculate, 6.5--25 cm. long, 3.5--18 cm. wide, densely many-flowered, brachiate, conspicuously and abundantly bracteolate, densely short-pubescent or puberulent throughout with flavescent or sordid-brownish hairs, the branches often chestnut-colored, tinged with green and purple when fresh; peduncles stout, reddish-brown when fresh, rather acutely tetragonal, often sulcate, 1.8--4 cm. long, densely short-pubescent or puberulent like the young twigs; sympodia and inflorescence-branches tetragonal, sulcate, and pubescent like the peduncles; pedicels obsolete or to 1 mm. long and densely flavescent-pubescent; bracts, bractlets, and prophylla very numerous and conspicuous, foliaceous, simple, pale- or yellowish-green, varying to chestnut and tinged with green and purple, elliptic, 5--17 mm. long, 2--7 mm. wide, densely short-pubescent on both surfaces, sessile, rarely 3-foliolate.

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A NEW SPECIES OF FORSTERONIA FROM THE AMAZON

Joseph V. Monachino

Some species of Apocynaceae, and of other families too, have a vast distributional range in South America. For instance, Prestonia acutifolia (Benth.) K. Sch. is known from Central America or Mexico to Argentina. P. coalita (Vell.) Woods., until Woodson's monograph in 1936 known from only southern Brazil (as far south as Rio Grande do Sul) and later found also in Paraguay, was subsequently determined from British Guiana (Monachino, Brittonia 7: 410. 1952), and now can be reported from Peru (G. Klug 4091, Dept. San Martín, Chazuta, Rio Huallaga, alt. about 260 m., forest, Apr. 1935) and northern Venezuela (A. H. G. Alston 5990, State of Carabobo, near Las Trincheras, alt. 800 m., forest, Dec. 23, 1938). Consequently, this species is now ascertained to have a distributional range of approximately 3000 miles, a distance surpassing the entire width of the United States. Forsteronia Duckei Mgf.*, previously known from only the type collected in Pará, Marajó, can now be reported from Esperança (Ducke 1889, ad ostium fluminis Javary, silva non inundabili, Oct. 29, 1945) and São Paulo de Olivença (Krukoff 8121, near Palmares, Varzea land, Sept. 11-Oct. 26, 1936), in western Amazonas, Brazil, some 1500 miles from the type locality. Another species of Forsteronia collected in the same localities, Esperança and São Paulo de Olivença, by the same men at about the same time, is here proposed as new. At present its known range is limited to the one area, but it remains to be seen how truly restricted may be its distribution. Probably the plant, difficult to collect because it is a tall vine in high forests, will eventually be discovered in a much wider region in the Amazon Basin, and the specific name is chosen in anticipation of this.

FORSTERONIA AMAZONICA Monachino, sp. nov.

Frutex scandens, caulibus juvenilibus puberulentis, foliis chartaceis, petiolis 5-7 mm. longis puberulis, laminis ellipticis 8-11.5 cm. longis 3.5-5 cm. latis acuminatis, ad basin rotundatis, glandis basi costae conspicuis; inflorescentiis spiciformibus confertis usque ad 4 cm. longis 1.5 cm.

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*The two specimens cited (deposited at NYBG) and an isotype (USNH) have some flowers with imbricate corolla-lobes, a type of aestivation unusual for the Apocynaceae. In the family the corolla-lobes are normally convolute, either dextrorsely or sinistrorsely depending on the genus.

latis, pedunculo usque ad 2.3 cm. longo hirtello, pedicellis usque ad 2 mm. longis; calyce hirtello, lobis ca. 2 mm. longis, squamellis lobos oppositis; corolla extus hirtella, tubo 1.3-1.4 mm. longo, intus barbato, lobis 2.7-3.4 mm. longis intus villosulis; antheris toto exsertis 2 mm. longis glabris; ovario apocarpo hirtello.

Woody vine, young stems puberulent, leaves opposite, chartaceous, petiole minutely hairy particularly on the upper side, 5-7 mm. long, blade elliptic, 8-11.5 cm. long, 3.5-5 cm. broad, abruptly acuminate at apex, rounded at base, glabrous (very sparsely ciliate on margins and puberulent on nerves on underside), glands at base of midrib conspicuous, often running down the channel of petiole, foveae minute; inflorescence spiciform, crowded, cylindrical, up to 4 cm. long, 1.5 cm. broad, peduncle up to 2.3 cm. long, rusty puberulent-hirtellous, bractlets at base of pedicel similar to but smaller than sepals, up to 1.5 mm. long, pedicel up to 1.7-2 mm. long; calyx 1-1.7 mm. broad at base, lobes not foliaceous, deltoid-lanceolate, ca. 2 mm. long, acute at apex, hirtellous outside, calycine squamellae rather weak, opposite lobes, medially located, laciniate; corolla white, moderately or rather heavily hirtellous outside, tube ca. 1.3-1.4 mm. long, bearded within above base, lobes dextrorsely convolute, lanceolate-ligulate, 2.7-3.4 mm. long, villosulose within; anthers wholly exserted, 2 mm. long, glabrous, filaments inserted near base of corolla-tube, becoming ca. 2 mm. long; ovary apocarpus, pubescent, tapering at apex, style 1 mm. long, narrowly conic stigmas about as long, with acute apucli, apices of filaments and style agglutinated, anthers forming a ring around stigma, nectaries deltoid, shorter than ovary, ca. 0.4 mm. long.

Type: Ducke 1891, Brazil, Amazonas, Esperança, ad ostium fluminis Javari, silva non inundabili, frutex scandens floribus albidis, Oct. 20, 1945 (holotype at The New York Botanical Garden). Paratype: B. A. Krukoff 9048, Brazil, Amazonas, basin of Rio Solimoes, Municip. São Paulo de Olivença, basin of creek Belem, approx. 20 kilom. from Colombian border, terra firma, high forest, vine, Oct. 26-Dec. 11, 1936 (The New York Botanical Garden).

The type and paratype of F. amazonica are almost identical. The species is very closely allied with F. tarapotensis K. Sch. ex Woodson and is found in the same phytogeographical province. It differs in its broader leaves, rounded and strongly glandular at the base; the young stems are puberulent and so are the petioles, particularly on the upper side. The inflorescence is broader and the pedicels are longer. F. tarapotensis has leaves less than 3 cm. wide, broadly cuneate and inconspicuously glandular at the base; the stems and petioles are glabrous or nearly so, and the pedicels are described as 0.4-0.5 mm. long. Woodson's description (Ann. Mo. Bot. Gard. 22: 195. 1935) was based on four collections, all from two neighboring localities (Tarapoto and Yurimaguas) in Peru; another collection made approximately 450 miles away, at a locality geographically close to that of the type of F. amazonica, Ducke 23939, Tabatinga, Amazonas, Brazil, also agrees with the type photo of F. tarapotensis.

Another species with spiciform inflorescences, the Colombian F. propinqua Woodson, which like F. amazonica has leaves rounded at the base, is readily separated by its very short pedicels and sparsely pubescent calyx and corolla; the corolla is almost glabrous without, the indumentum on the stem and pedicels is of longer and stiffer hairs, and the glands at base of the leaf-blades are inconspicuous. This species is allied with F. spicata (Jacq.) G. F. W. Meyer, on basis of its syncarpous ovary; unlike F. tarapotensis, it differs from F. amazonica in fundamental features.

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BOOK REVIEWS

Alma L. Moldenke

"Plants of the Bible", by A. W. Anderson; 72 pp., 12 pl. Philosophical Library, New York 16, N. Y. 1957. $6.

This book is very interesting in its writing style, pleasing in format, informative in content, and attractive in its illustrations.

There are twelve lovely color plates, such as those by the artist Redouté, reproduced from rare tomes long since out of print and now available only in a few botanical and museum libraries and in the carefully protected cases of a few bibliophiles. Even though the present-day mass production method of color plate printing cannot yet repeat the exquisite beauty of the older individually tinted ones, it has the advantage of greater numbers and lower prices. Consequently these "things of beauty" have a renewed chance of becoming "a joy forever" for so many, many more casual readers and students of this book and any other one similarly produced. Thus this book perpetuates very appropriately these artistically beautiful and scientifically accurate treasures of the past.

The text evidences the author's careful study of the subject and his competence in evaluating his findings. For almost all of his identifications of Bible plants he has either the full approval of past and present authorities in this field or else their concession as to the possibility of his determination.

Anderson suggests the leaves of Ficus sycomorus for the modesty aprons of Adam and Eve, while it is generally supposed that they were made from the related F. carica. The latter interpretation would provide not only a more accurate translation for the original Hebrew term employed in the Old Testament, but would also provide a much more effective cover.

Perhaps a more plausible determination for the controversial "rose of Sharon" in Song of Solomon 2: 1 is *Tulipa montana* or *T. sharonensis*.

Mr. Anderson does not differentiate clearly between the three entirely different types of "manna" mentioned in the Bible. The Sinai Manna and the Manna Tamarisks provided the resinous material that constituted the "manna" of commerce. The "manna" of Exodus 16: 13—21, which grew up in the night when the ground was moist and later stank in the heat of the sun, probably came from some species of the algal genus *Nostoc*. The "manna" that fell from heaven was in all probability some windborne lichens of the genus *Lecanora* from distant mountains.

The suggestion that the false-flax, *Camelina sativa*, was the plant in Exodus 9: 31 smitten with the barley during one of the plagues, is most interesting. The species is recorded by Post from this general area and it does have edible seeds about which the inhabitants of the land might well have been concerned. Yet it is more likely that the true flax, *Linum usitatissimum*, is referred to here, as the Hebrew word employed seems to indicate.

Similarly, there seems to be more evidence that the "apple of Sodom", mentioned in Deuteronomy 32: 32, was *Citrullus colocynthis* rather than *Solanum incanum* as maintained by the author. *Poterium spinosum* is a good suggestion for the "cracking thorns" of Ecclesiastes 7: 6.

Of course, this small book does not presume to encompass all the plants of the Bible; it chooses, rather, only the most important of them.

The only unfortunate aspect of the book is the carelessness in the printing of this American edition. Several words are misspelled -- *Ornithogalum*, sycomore, and *sycomorus* in several places, among on page 8, *colocynthis* on page 13, carcass on page 42, and caraway on page 67. The word "civilization" escaped in one place being given the American spelling. There are also a few punctuation errors, as, for instance, the omission of a period preceding "Post" on page 14. On page 8 we find "*P. alba*" apparently referring to *Platanus* instead of to *Populus*.

The book's dust-jacket tells the simple truth when it claims that "Plants of the Bible" is a book which will appeal both to flower-lovers and lovers of the Bible.

"Plant classification", by Lyman Benson; 701 pp., illustr.
D. C. Heath & Co., Boston 16, Mass. 1957.

A very competent teacher, taxonomist and field botanist has just produced this excellent book as a college text on plant classification.

It was a joy to this reviewer to read the book from cover to cover (covers included), and it should be a stimulating and worthwhile learning experience for the student. In the preface for the teacher the author indicates how and why this treatise can be used as an elementary text, but I feel that it would serve well there only if it were presented to entering college students who are quite sure that botany, or one of its allied fields, is their major interest, or to those who have easily available to them texts that are simpler and more general in scope. There is just too much of content, concept and terminology about only one part of the world of plant life to be representative to or digestible by young people no more than a year out of secondary schools, especially those with an urban background. To them "A Tree that Grows in Brooklyn" can only be a book and not an Ailanthus altissima (Mill.) Swingle.

The author also indicates how and why this treatise can serve as an advanced text, and with this I heartily agree. For the student prepared to assimilate this work there are great treats in store: The photographs and drawings are unusually attractive, helpful and numerous. The explanations of the nature and use of keys are the best I have yet seen in print. The suggested exercises in "keying" and key building are so obvious and helpful for novices. Personal and institutional herbaria are described for the student to show intimately and logically their vital functions. For young people so exposed herbaria will never again be the musty places where dried old weeds are shuffled between sheets by detached old people.

The book may well be used in any geographical section of the United States. The survey chapters on plant anatomy, evolution and ecology are wonderfully explicit, yet also give the picture of the range of variations in plant parts far better than in any other general text in the field.

I suppose that I should mention that the word "judgment" is spelled in two different ways on two succeeding lines on page 460. However, basically the printing job is a very neat and accurate one.

Whether or not this author's arrangement of the major plant groups is a more efficient one for teaching purposes I can only surmise. I would certainly like to teach a course to a junior or senior college group with this text. Since texts typically have their origin in authors' heads long in advance of printing, and since they then usually go through several metamorphic stages in mimeograph form, they finally come from the publisher's presses already seasoned. Since this one is Dr. Benson's work, it is safe to conclude that it will prove itself to be very good.

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS VITEX. IX

Harold N. Moldenke

VITEX PINNATA L.

Bracts, bractlets, and prophylla rarely 3-foliolate, at the base of the lowermost panicles; flowers slightly odorous or odorless; calyx campanulate, pale- or yellowish-green when fresh or sometimes chestnut and tinged with green and purple, about 4 mm. long and 7 mm. wide, densely short-pubescent on the outside and on the teeth within, the teeth deltoid, about 2 mm. long; corolla hypocrateriform, 2-lipped, in general aspect varying from purple, purplish, or violet to bluish-white, white, or light-yellow, the tube about 10 mm. long, the lower portion glabrous on both surfaces, the upper portion pubescent and glandular on the outside, the throat glabrous except near the somewhat villous base of the middle lobe of the lower lip and near the insertion of the stamens, the upper lip varying from white to blue, violet, or purple, the lower lip pale-mauve, with its two lateral lobes often white or whitish, the larger lip about 1 cm. long and 5 mm. wide, the lobes pubescent on the outside except near the margins of the lip, glabrous within, the smaller ones about 5 mm. long and 3.5 mm. wide; stamens exserted, 11--13 mm. long, inserted at about the middle of the corolla-tube, the insertion densely villous; filaments white; anthers dull-grayish-brown or nearly black before opening; style white, 1.5--1.8 cm. long, usually equaling the stamens; stigma bifid; ovary greenish except for the purple apex, glabrous; fruiting-calyx not enlarged; fruit drupaceous, green and shiny when young, globose or flattened-globose, 7--13 mm. long and wide, glabrous.

The species is widely distributed in tropical Asia from East Bengal through India, Ceylon, and Burma to Indo-china, Malaya, the Philippines, Indonesia, and the Sunda Islands. It has been introduced in British Guiana and Madagascar, and is cultivated in tropical Asia, Hawaii, Réunion, Madagascar, and Belgium.

The specific epithet here adopted for this species seems definitely to be the correct one, in spite of its being very inappropriate, since the leaves are palmately and not pinnately compound. In the Linnean Herbarium at London sheet number 10, under the genus Vitex, is inscribed "pinnata" in Linnaeus' own handwriting and bears also the notation in Linnaeus' handwriting: "Fl. Zeyl. 415" and "India D." Later J. E. Smith struck out the word "pinnata" in pencil and wrote: "minime; nil nisi V. trifoliata J. E. Sm. vera V. pinnata in H. B." Jackson has supplied in his notes on the Linnean Herbarium the name "Dalman" for Linnaeus' "D." as the name of the collector and "Herb. Banks" for Smith's "H. B." as the name of the herbarium in which the truetype of V. pinnata is deposited. The Dalman specimen in Linnaeus' herbarium actually is V. trifolia L. and matches well sheets number 6 and 7 which are so labeled in Linnaeus' hand.

Smith's "trifoliata" is doubtless an error for "trifolia". The Banksian Herbarium, contained in volume 1 of Paul Hermann's herbarium at the British Museum, on page 16, contains the type specimen of Hermann's Anonyma and Linnaeus' Pistacio-vitex, on which names Linnaeus based his Vitex pinnata. The Hermann speciman is actually inscribed "415", the number of Linnaeus' Pistacio-vitex in his Flora Zeylanica, and is plainly conspecific with what has in the past been identified as Vitex pubescens Vahl. One leaf of this specimen has its five leaflets mounted in pinnate fashion, which may account for Linnaeus' inappropriate specific epithet. The specimen is not glabrous as Linnaeus says in his description, and it is definitely not Aglaia odorata Lour. as stated by Jackson in Index Kewensis 2: 1214 (1895) and as implied by Schauer in A. DC., Prodr. 11: 696 (1847). There is no doubt in my mind that this Hermann specimen is the type of the species now under consideration and that the species' correct name, under the present rules of nomenclature, is Vitex pinnata.

The original description of Vitex pinnata by Linnaeus in Sp. Pl., ed. 1, page 638 (1753) is as follows:

"pinnata. 4, VITEX foliis pinnatis, paniculis trichotomis.
Pistacio-vitex. Fl. zeyl. 415*.
Habitat in Zeylona. ♄"

In his Flora Zeylanica, page 195 (1747), his description is as follows:

"415. PISTACIO-VITEX.
Anonyma. Herm. herb. 1. p. 16.
Descr. Arbor. Folia opposita, pinnata (Pistaciae), saepe ex quinque foliolis ovalibus, glabris, plicatis, integerrimis, obtusis, solidis. Panicula terminans ramos brachiato-dichotoma. Calyx monophyllus, campanulatus, obsolete quadridentatus, persistens. Corolla monopetala, ringens; labio superiore breviore, reflexo, bipartito, labio inferiore trifido, reflexo: media majore. Stamina sub labio superiore, corolla paullo longiora. Germen ovatum; stylus facie staminum; stigma bifidum, acutum. Drupa."

The type of V. arborea is Roxburgh s.n. from India; the type of V. pubescens var. lilacina is Kuntze 6086 from Singapore. The V. heterophylla of Roxburgh and of Williams are actually V. quinata (Lour.) F. N. Will., while that of Schauer is V. urceolata C. B. Clarke. The V. latifolia Blanco is V. parviflora A. L. Juss., V. latifolia Mill. is V. agnus-castus f. latifolia (Mill.) Rehd., and V. latifolia Wight is V. altissima L. f. The V. pubescens Heyne is V. altissima L. f., while V. pinnata Lour. ex Schau. in A. DC., Prodr. 11: 696, in syn. (1847) is Aglaia odorata Lour., in the Meliaceae.

Bakhuizen van den Brink 7423 is a mixture with something not verbenaceous, while Elmer 21101, distributed as this species in the Dudley Herbarium, is Hemisantiria rostrata (Blume) H. J. Lam of the Burseraceae.

The species is found in forest land, on slopes in forests, in dry open soil, in compact black moist soil of wooded flats, in stony soil on densely wooded riverbanks, and on the borders of mangrove swamps, from sea level to 1300 meters altitude. In Thailand it is said to be scattered or common in deciduous forests and along the edges of evergreen jungles, and it is found on seashores on Simalur Island. Henderson says that it occurs also on Dayang Bunting. It has been misidentified in herbaria as Vitex alata Willd., V. heterophylla Roxb., V. leucoxylon L. f., V. littoralis Decne., and V. saligna Roxb. It has been collected in anthesis from January to September and in December, and in fruit in March, April, June, August, September, October, and December. It is thus probable that the plant flowers and fruits throughout the year. Its wood is very durable and is used for construction purposes of various sorts in southern India. In Burma it is used to make wooden bells. Moulton says that the "color of flowers [is] Saccardo 2". L. H. Bailey, in his unpublished list of dealers handling Verbenaceae, gives "Singapore" as offering "Vitex pubescens".

Koorders 9788b has one leaf 1-foliolate, while on Herb. Hort. Bot. Bogor. XI.J.5 in the Utrecht herbarium and on Herb. Buitenzorg 24613 and 26601 the leaves are insect-galled. The Kelly 246 collection does not state on its label that it represents cultivated material, but is from Honolulu and therefore is probably from cultivated plants. The Burger 211 and 345, cited below, are seedlings 3 and 45 cm. tall — they exhibit leaves 1- and 2-foliolate, the lowest ones serrate-dentate. Docters van Leeuwen, in the references cited above, states that a gall-mite, Eriophyes cryptotrichus Nal. forms small vesicle galls on the upper surface of the leaflets, with an erineum on the lower surface.

Among the many recorded vernacular names for this species are the following: "ablas", "alaban", "alapan", "aloban", "alobanbunga", "amuráon", "binh linhn ghê", "black lĕban", "búsi", "Ceylon pinnate-leaved Vitex", "cooked rice leban", "din", "flowery lĕban", "goelimpapa", "halaban", "halban", "halĕban", "haniban", "hèjas", "horn lĕban", "htouk-sha", "kalapapa", "kaloean", "kaloeban", "kā non", "ki arak", "kiketaroe", "kikĕtaroe", "koemilan", "kon samaw", "kopiher", "kulimpápa", "kyet yo", "kyet-yob", "laban", "laban boenga", "laban hout", "laban kaenjit", "laban kapoer", "laban kĕtilĕng", "laban koenjit", "laban pandoek", "laban poetih", "laban soengoe", "laban tandoek", "labari", "labhan", "leban", "lĕban", "lĕban boenga", "lĕban bunga", "lĕban haniban", "lĕban hitam", "lĕban koenjit", "lĕban kunyit", "lĕban nasi-nasi", "lĕban pantis", "lĕban tandoek", "lĕban tandok", "lĕban toengkak", "lĕbĕn", "ma'ne", "manèh", "manil alas", "molave", "moláve", "morón", "muria", "myladí", "nĕban", "nevalad ugu mánu", "nevali adugu", "non", "nowli eragu", "pagil", "pantjar", "popoul romiet", "salingkápa", "samaw buang", "samaw tīn pēt", "saphun thong", "ta phun", "tileng", "tin nok", "trasek", and "tumeric lĕban". Some of these names are also applied to other species of the genus. For instance, "black lĕban" is applied also to V. vestita Wall., "cooked rice leban" to V. gamosepala Griff., "laban kĕtilĕng" to V. glabrata R. Br. and to V. heterophylla var. undulata (Wall.) C. B. Clarke, "lĕban" to V. vestita and to V. negundo L., "lĕban kunyit" and "tumeric lĕban" to V. longisepala King & Gamble and to V. vestita, "lĕban bunga" to V. longisepala, and "lĕban boenga" to V. heterophylla var. undulata.

Dr. Lam uses the term "pubescent" in many parts of the description where I feel that "puberulent" is more accurate. He includes V. latifolia Blanco in the synonymy of this species, but it actually belongs under V. parviflora A. L. Juss. He gives the erroneous date "1786" for Lam., Encycl. 2: 613 and "1856" for Miq., Fl. Ind. Bat. 2: 862 (actually 1858; cfr. Bull. Jard. Bot. Buitenz., ser. 3, 13: 28). He states that Hallier is right in adopting the name Vitex latifolia as the valid name for this species, but to do so, he says, would "cause confusion". Actually, Lamarck's name is invalidated by the V. latifolia of Miller proposed twenty years earlier.

In addition to collections cited below, Lam cites Horsfield s.n. (Ut--49899) from Java, Heutsz 832 from Borneo, Bruinier 8 and 227 from Sumatra, "Yates 36299" from Tawitawi, and Achmad 1605 from Simalur Island. The species is also reported from Banguey.

Citations: BRITISH GUIANA: A. W. Bartlett s.n. [Lamaka Canal, Sept. 1907] (K, N, U). MADAGASCAR: Boivin s.n. [1847-1852] (P). INDIA: Andhra: Santapau 20906 (Xa); Wagh 3003 (Xa), 3900 (Xa), 3901 (Xa). Assam: Wallich 1747 (T), 1747.2 (S). Khasi States: Hooker f. & Thomson s.n. [Mont. Khasia] (Br, M, S). West Bengal: Helfer 132 (Bt--41023, Bz--25036, Go, N, S); Herb. W. Griffith 6060 (T); Rao 5654 (N). State undetermined: Roxburgh s. n. (Br, Br, N--photo, Z--photo); Voigt s.n. [Ind. orient.] (Cp). BURMA: Tenasserim: C. E. Parkinson 14442 (N); Shaik Mokim 591 (Bz--25039). ANDAMAN ISLANDS: Helfer 6060 (S). INDOCHINA: Cochinchina: G. E. Perry s.n. [7/1870] (S), s.n. [Poulo-condor] (S); Pierre 2224 (S, S). THAILAND: Bunnak 290 [Herb. Roy. Forest Dept. 9360] (Z), 331 [Herb. Roy. Forest Dept. 12087] (Ss); Smitinand 1414 [Herb. Roy. Forest Dept. 7798] (Ss). MALAYA: Langkawi: M. R. Henderson 28943 (Bz--25044). Malacca: W. Griffith s.n. [Malacca, 1845] (Br). Pahang: Corner 25768 (N); M. R. Henderson 10750 (Bz--25037), 18466 (Bz--25038). Penang: Haniff 124 (La). Singapore: N. J. Andersson s.n. [Singapore, 28 Jan. 1853] (S); Collector undesignated s.n. (Bz--25041, Bz--25042, Bz--25043); Kuntze 6086 (N, Qu). PHILIPPINE ISLANDS: Balabac:

Mangubat s.n. [Herb. Philipp. Bur. Sci. 482] (Bz--24880, N). Culion: E. D. Merrill 451 (N), 502 (N). Guimaras: Gammill s.n. [Herb. Philip. Forest Bur. 273] (N). Jolo: Klemme s.n. [Herb. Philip. Forest Bur. 22534] (Cm, Gg--31500). Mindoro: Merritt s.n. [Herb. Philip. Forest Bur. 9800] (N). Palawan: Bermejos s.n. [Herb. Philip. Bur. Sci. 189] (Bz--24881, Gg--31501, N); Curran s.n. [Herb. Philip. Forest Bur. 3486] (Bz--24877), s.n. [Herb. Philip. Forest Bur. 3783] (N); Danao s.n. [Herb. Philip. Forest Bur. 19903] (Bz--24874); Edaño s.n. [Herb. Philip. Bur. Sci. 77441] (N); A. D. E. Elmer 12550 (Bz--24876), 12660 (N, Ut--29525), 13004 (Bz--24875, N, Ut--29521); Escritor 1358 (Bz--24884); Foxworthy 762 (Bz--24879, N, Ut--16457), s.n. [Herb. Philip. Bur. Sci. 762] (Bz--24878); Manalo s.n. [Herb. Philip. Forest Bur. 7412] (Br); E. D. Merrill 1364 (Bz--24883); C. Miranda s.n. [Herb. Philip. Forest Bur. 31380] (N). Sulu: Ramos & Edaño s.n. [Herb. Philip. Bur. Sci. 44138] (N). Tawitawi: Yates s.n. [Herb. Philip. Bur. Sci. 36299] (Bz--24882). RIOUW ARCHIPELAGO: Bakong: Bünnemeijer 7605 (Bz--25017). Bintan: Bünnemeijer 6215 (Bz--25027), 6375 (Bz--25029, Bz--25030). Karimon: Bünnemeijer 7863 (Bz--25025, Bz--25026, Bz--25666). LINGGA ARCHIPELAGO: Singkep: Bünnemeijer 7318 (Bz--25016); Kassim 17 [Boschproefst. BB.4069] (Bz--25015). NIAS ISLAND: Chairoeddin 50 [Boschproefst. BB.5749] (Bz--25023), 52 [Boschproefst. BB.5751] (Bz--25022). SUMATRA: Abdoelmoein 14 [Boschproefst. BB.8944] (Bz--24913); Achmad 1605 (Bz--25031, Bz--25032, Bz--25033); Adam 156 [Boschproefst. BB.9385] (Bz--24920); Ajoeb 15 (Bz--24956); Alfiah 19 [Boschproefst. BB.12290] (Bz--24904, Ut--97168); Alimoesa 14 [Boschproefst. BB.8366] (Bz--24915, Bz--24916, Ut--82000); Asdat 12 (Bz--72933); Bahen Samosir 12 [Boschproefst. BB.29440] (Bz--24899); Bakarroeddin 19 [Boschproefst. BB.9059] (Bz--24912); Bal 12 (Bz--24977), 47 (Bz--24976); Barends B.W.4a [Boschproefst. BB.8421] (Bz--24914), B.W.5a [Boschproefst. BB.8422] (Bz--24924); H. H. Bartlett 8738 (N); Bastiaan 14 [Boschproefst. BB.6063] (Bz--24929); Beguin 399 (Bz--24963, Bz--24964, Bz--24965); Boschwezen 1 (Bz--24986), 2 (Bz--24987); Bruinier 14 (Bz--24953), 73 (Bz--24959), 87 (Bz--24960), 148 (Bz--24962), 183 (Bz--24909), 210 (Bz--24908), 227 [Soeratman 3] (Bz--24961); Bünnemeijer 245 (Bz--24982, Bz--24983); Buwalda 567 [Boschproefst. BB.29975] (Bz--24988, Bz--24989); Collector undesignated 2 (Bz--24943), 14 (Bz--24933, Bz--24934), 16 [Boschproefst. BB.3078] (Bz--24946, Ut--80734), 82 [Boschproefst. BB.608] (Bz--24947, Bz--24948), 322 (Bz--24910), s.n. (Bz--72597); Daalen 478 (Bz--24932); Djamarief 10 [Boschproefst. BB.6621] (Bz--24968); J. M. Dumas 1544 (Bz--24955), 1612 (Bz--24984, Bz--24985); Endert 671 (Bz--24952); H. O. Forbes 1273 (Vu); Galoengi 465

(Bz--24907); Grashoff 610 (Bz--24942, Bz--24944); Gusdorf 7 (Bz--24941), 75 (Bz--24937), 108 (Bz--24958), 131 (Bz--24938), 139 (Bz--24940), 213 (Bz--24939), 235 (Bz--24957); A. Hasan 19 [Boschproefst. BB.7720] (Bz--24928); Heyne s.n. (Bz--24935, Bz--24936); Kohar 7 [Boschproefst. BB.8265] (Bz--24923); Koorders 10482b [147 exp.] (Bz--24990), 10485b [148 exp.] (Bz--24992, Bz--24994), 10588b [14] (Bz--24995, Bz--24996), 10590b [13] (Bz--24997, Bz--24998), 10593b [15] (Bz--25001), 10594b [81] (Bz--25002), 10595b [80] (Bz--25000), 10600b (Bz--24999); Krukoff 314 (Bz--24917), 335 (Bz--24911, N), 4337 (Br, Bz--24906, N); Lörzing 3150 (Bz--24954), 4494 (Bz--24931), 9685 (Bz--24945); Mandaer Deloeng 181 [Boschproefst. BB.9687] (Bz--24951); Naimoen 19 [Boschproefst. BB.8713] (Bz--24925); Nasir 146 [Boschproefst. BB.9375] (Bz--24981); Oelong 151 [Boschproefst. BB.9380] (Bz--24918); Oemar Hasan 21 [Boschproefst. BB.2978] (Bz--24970, Bz--24971, Ut--80722); Polin Pasariboe 27 [Boschproefst. BB.6456] (Bz--24966, Bz--24967); Posthumus 572 (Bz--24949, Bz--24950), 723 (Bz--24978, Ut--97182); Rasjid 67 [Boschproefst. BB.9143] (Bz--24921); Renwarin 96 [Boschproefst. BB.2838] (Bz--24969); Roderkerk 18 (Bz--24905); Ropi 3 [Boschproefst. BB.8250] (Bz--24927); Saleh 21 [Boschproefst. BB.9319] (Bz--24979, Bz--24980); Sjamsoeddin 17 [Boschproefst. BB.5966] (Bz--24930); Thorenaar 30.T.1.P.34 (Ut--67822); Toroes 364 (N, N, S), 2367 (N), 4190 (N); Ultée 113 (Bz--24926); Yates 1267 (Bz--24922, N); Zwaan T.3.P.839 (Bz--24972, Bz--24973, Bz--24974, Bz--24975). KARIMANDJAWA ISLANDS: Karimandjawa: Hardjowijono 6 [Boschproefst. Ja.1709] (Bz--24801). MANTAWI ISLANDS: Siberut: Boden-Kloss 14529 (Bz--25019); Iboet 211 (Bz--25020), 324 (Bz--25021). ANAMBAS ISLANDS: Anambas: M. R. Henderson 20343 (Bz--25024). Siantan: Bünnemeijer 5790 (Bz--25028). JAVA: Backer 56 (Bz--24651, Bz--24652, Bz--24653), 1183 (Bz--24659), 1432 (Bz--24659), 3976 (Bz--24632), 10179 (Bz--24699), 11818 (Bz--24657), 16628 (Bz--24706), 17292 (Bz--24698), 17439 (Bz--24697, Ut--58718, Ut--58719), 17870 (Bz--24708), 18081 (Bz--24707), 24104 (Bz--24690), 26374 (Bz--24688, Bz--24689, Ut--53118), 30506 (Bz--24702, Bz--24703, Bz--24704), s.n. [Dec. 1902] (Bz--24627, Bz--24644, Bz--24645), s.n. [Jan. 1904] (Bz--24623, Bz--24642, Bz--24711, Bz--24713), s.n. [Mai 1904] (Bz--24643), s.n. [Sept. 1904] (Bz--24712), s.n. [April 1906] (Bz--24715), s.n. [Bandjar] (Bz--24719); Bakhuizen van den Brink 907 (Bz--24696), 1563 (Bz--24648, Bz--24649, Ut--24869), 3197 (Bz--24686, Bz--24687), 3308 (Ut--24870a), 7423, in part (Bz--24634), 7878 (Bz--24640); Berger 6 (Bz--24641), 12 [Boschproefst. Ja.1256] (Bz--24683), 266 (Bz--24626); Beumée 675 (Bz--24051), 1024 (Bz--24646), 1286 (Bz--24669), 1404 (Bz--24670), 2106 (Bz--24677), 4968 (Bz--

24685); Blokhuis s.n. [April 1919] (Bz--24624, Bz--24625); Blume s.n. [Java] (N, N); C. Boot 4001d (Bz--24635); Boschwezen 9 [Herb. Bot. Var. 358] (Bz--24058), K.21 (Bz--24673, Bz--24674); Buwalda 7441 (Bz--72935); E. W. Clason B.95 (Bz--24682); Clason & Slooten 47 (Bz--24681); Collector undesignated 46 (Bz--24633); De Vries 9 [Boschproefst. BB.10424] (Bz--24903); Docters van Leeuwen-Reijnvaan s.n. [17 October 1910] (Bz--24664); Drowirodihoeda 8/II [Boschproefst. Ja.1635] (Bz--24630); Edeling s.n. [Batavia] (Bz--24660); Franck 128 (Bz--24629); Grutterink 3137 (Bz--24676); H. Hallier 49 (Bz--24052), s.n. (Bz--24671); Herb. Hort. Bot. Bogor. 231 (Bz--24716); Houter 153 (Bz--24717); Jansen 5724a (Bz--24636, Bz--24637); Kalshoven 55 (Bz--24700, Bz--24701); Karta 242 (Bz--24859, N), 311 (Bz--24800); Kartodinhardjo 12/348 [Boschproefst. Ja.1998] (Bz--24680); Kollmann s.n. [Java, 1838] (N); Koorders 47 (Bz--24654), 96a (Bz--25708), 152 (Bz--24655), 7855w (Bz--24832, Bz--25709), 8074t (Bz--25668), 9741b (Bz--24806), 9742b [96a] (Bz--24807, Bz--24808), 9773b [1012a] (Bz--24722), 9774b [1064a] (Bz--24723, Bz--24724), 9775b [1064a] (Bz--24724, Bz--24726), 9776b (Bz--24768), 9777b [1146a] (Bz--24769), 9778b (Bz--24777), 9779b (Bz--24778), 9780b (Bz--24782), 9781b (Bz--24779), 9782b [362] (Bz--24720), 9783b [11a] (Bz--24791), 9784b [96a] (Bz--24809), 9785b [11b] (Bz--24792), 9786b [11c] (Bz--24793), 9787b [11c] (Bz--24797, Bz--24798), 9788b [11f] (Bz--24799), 9789b [11f] (Bz--24800, Bz--24801), 9790b [11f] (Bz--24802, Bz--24803), 9791b [1026i] (Bz--24738, Bz--24739), 9792b (Bz--24732), 9793b, in part (Bz--24060), 9794b [6053t] (Bz--24842), 9795b [7801t] (Bz--24734), 9796b [7801t] (Bz--24635), 9797b [7843t] (Bz--24736), 9798b [7862t] (Bz--24824), 9799 [7950t] (Bz--24818), 9800b [8074*] (Bz--24819), 9801b (Bz--24835), 9802b [8182t] (Bz--24836), 9803b [8186t] (Bz-24839), 9804b (Bz--24833), 9805b (Bz--24830), 9806b (Bz--24812), 9807b (Bz--24831), 9808b (Bz--24814), 9809b (Bz--24813), 9812b (Bz--24780, Bz--24781), 9813b (Bz--24794), 9814b (Bz--24727), 9815b (Bz--24728), 9816b (Bz--24729), 9818b (Bz--24788), 9819 (Bz--24731), 9820b (Bz--24789), 9821b (Bz--24762, Bz--24763), 9822b (Bz--24787), 9823b (Bz--24790), 9824b (Bz--24743), 9826b [7852t] (Bz--24820, Bz--24821), 9827b [7854t] (Bz--24822), 9846b]6067*] (Bz--24840), 11686b [1782m] (Bz--24730), 11691b [1823m] (Bz--24751, Ut--58720), 11693b [1634*] (Bz--24753), 11852b [1146a] (Bz--24770), 12248b [1286a] (Bz--24773), 12297b [1294a] (Bz--24772), 12298b [1301] (Bz--24775), 12299b [1290a] (Bz--24774), 12320b [1064a] (Bz--24766), 12805b [6053t] (Bz--24843), 12806b [6126t] (Bz--24844, Bz--25667), 12850 [7854t] (Bz--24823), 12853b [6126t] (Bz--24845), 12856b (Bz--24834), 13104b [4279*] (Bz--24816), 13164b [7988*] (Bz--24827, Bz--24828), 13290b [7855*] (Bz--24841), 13532b [1782m] (Bz--24747), 13535b [1782m] (Bz--24748, Bz--24749), 13595b (Bz--24805), 13713b (Bz--24804), 13747b [523d] (Bz--24756), 14736b (Bz--24815), 15661b (Bz--24761, Ut--64059), 15667b (Bz--24760, Ut--80723), 20060b [1065c] (Bz--24764), 20188b [1207c] (Bz--24785), 20224b [1180c] (Bz--24786), 20270b [1070c] (Bz--24784), 20635b (Bz--24846), 20649b [7801t] (Bz--24733), 21589b [7843t] (Bz--24737), 22558b [1823m] (Bz--24752), 25157b [112c] (Bz--24754), 25291b [96a] (Bz--24810, Bz--25710), 25293b [96b] (Bz--24811, Ut--58722), 25295b [11c] (Bz--24796), 27041b (Bz--24765), 27047b [695*] (Bz--24776), 28168b [301*] (Bz--24758), 28169b [293*] (Bz--24757), 28475b [1026i] (Bz--24740, Bz--24741), 29120b [1266*] (Bz--24829), 29594b (Bz--24746), 29735b [1673*] (Bz--24759), 30277b [683*] (Bz--24085), 32988b [1386*] (Bz--24826), 33022b [1294a] (Bz--24783), 33110b [1064a] (Bz--24767), 33703b [341f] (Bz--24755), 34100 [1026i] (Bz--24742), 34233b [1146a] (Bz--24771), 35728b [2190*] (Bz--24744), 35731b [2422*] (Bz--24745), 36807b [1782m] (Bz--24750), 38901b [855w] (Bz--24817), 39734b [8182t] (Bz--24838), 39772b [8186t] (Bz--24837), 39814b [7854t] (Bz--24825), 42310b [90r] (Bz--24067), 44483b [72] (Bz--24721), s.n. (Bz--25683); Kuntze s.n. [Java, 1875] (N); Lam & Went 1555 (Bz-24148); Martono 31 [Boschproefst. Ja.2280] (Bz--24639); Noltée 3460 (Bz--24667), 4001 (Bz--24675), 4625 (Bz--24665, Bz--24666); Ottens 23 (Bz--24647), s.n. [Buitenzorg] (Bz--24661, Bz--24662, Bz--24663); Ploem s.n. (Bz--24695); Saimoendt 38 (Bz--24684); Scheffer s.n. (Bz--24692, Bz--24694, Bz--24718); Slooten 2449 (Bz--24638); Soegandiredja 33 (Bz--24672); Teijsmann s.n. (Bz--24693); Tjokrosondjojo 22 [Boschproefst. Ja.1544] (Bz--24631); Van den Burg 3 [Boschproefst. Ja.3954] (Bz--24656); Van Steenis 11411 (Bz--24619, Bz--24620), 11571 (Bz--72797); Versteegh 27 [Boschproefst. Ja.4912] (Bz--24628); Vorderman s.n. [Batavia] (Bz--24621, Bz--24622); Wagiman 84 [Boschproefst. Ja.1898] (Bz--24678, Bz--24679); Wawra 215 (V, V); E. J. Wind 18 (Bz--24668); Wind Hzn 6203 (Bz--24709); Wisse 99 (Bz--24705, Bz--24710); Zollinger 229 (S). KAMBANGAN: Straelen 12 (Bz--24650). BRITISH NORTH BORNEO: Baker & Baker s.n. [Jan. 26, '15] (Gg--31473); Clemens & Clemens 29842 (Bz--24587); A. D. E. Elmer 20101 (Bz--24580, Bz--24592, Cm, Cn, Du--168114, Ka--67223, S, Ut--82742), 21095 (Br, Bz--24594, Du--164124, N, S, Ut--86375); Evangelista 984 (N). SARAWAK: Clemens & Clemens 21040 [field no. 5139] (Bz-24590, Bz--24591, N), 21055 [field no. 6395] (N); Foxworthy 11 (Cm); Hose 223 (Ph); Native collector 452 (Bz--24606), 519 (Ph), 523 (Ph), 1838 (Ph). BORNEO: Abdulhamid 330 [1509; Boschproefst. BB.15234] (Bz--24589), 1476 [Boschproefst. BB.15201] (Bz--24588); Adan 10 [Boschproefst. BB.2472] (Bz--24607), 34 [z.o.B. 4012;

Boschprofst. BB.13965] (Bz—24593); Atjil 10 [3774; Boschproefst. BB.11620] (Bz—24572); Baderoen 2 [Boschproefst. BB.2621] (Bz—24596); Becking 38 (Bz—24611); Boschwezen 2103 (Bz—24608, Bz—24609, Bz—24610); Buwalda 7965 (Bz—72884); Dachlan 49 [3525; Boschproefst. BB.10727] (Bz—24574); Delmaar 1897 (Bz—24581, Bz—24582); Dunselman 138 (Bz—24569); Endert 1459 (Bz—72886), 1490 (Bz—72883), 3274 (Bz—72885); Haan 922 [Boschproefst. BB. 31014] (Bz—24900); H. Hallier B.790 (Bz—24579), B.903 (Bz—24578), B.926 (Bz—24577); Henar 68 (Bz—25441); Ir. v. W. 12 (Bz—24568); Jaheri s.n. [1893] (Bz—24585, Bz—24586); Jong 52/3/W.B. [Boschproefst. BB.9772] (Bz—24595); Kahar 2008 (Bz—24601, Bz—24602); Kapoeas 2136 (Bz—24600); Labohm 14 (Bz—24605), 1156 (Bz—24603), 1210 (Bz—24604); Moulton 6742 (Bz—24599); Obi 105 [3451; Boschproefst. BB.10587] (Bz—24573); Polak 190 (Bz—73008), 696 (Bz—72858), s.n. (Bz—26601); Polak & Main 1985 (Bz—73009); A. Rasjid 7 [2440] (Bz—24576); Ruttens 8 (Ut—17053, Ut—17054), 406 (Bz—24583, Bz—24584, Ut—22539, Ut—22558), 742 (Ut—40881); Soeriodikarto 5 [2428] (Bz—24575); Thorenaar 30.J.1.P.34 (Bz—24902); Winkler 2156 (Bz—24597, Bz—24598); Zwaan 621 [Boschproefst. BB.12156] (Bz—24570, Bz—24571), s.n. [Boschproefst. 30.J.1.P.34] (Bz—24901). KARIMATA ARCHIPELAGO: Penebangan: Mondi 112 (Bz—72972, Ut—10983a). CELEBES: Boschbouwproefstation 1 (Bz—24893); Gobel 1 [Boschproefst. BB.19394] (Bz—24891); Noerkas 292 (Bz—24886); Pesik 1 (Bz—24892); Riedel 79 (Bz—24895), s.n. [Gorontalo] (Bz—24890); Teijsmann 12361 (Bz—24887, Bz—24888, Bz—24889), 12487 (Bz—24896, Bz—24897), 12526 (Bz—24894); Vuuren 292 (Bz—24885). SALAJAR ISLANDS: Salajar: Bünnemeijer 6572 (Bz—25018). KANGEAN ARCHIPELAGO: Bangko: Backer 29236 (Bz—24850). Kangean: Backer 27163 (Bz—24854), 28115 (Bz—24855, Bz—24856, Bz—24857, Bz—25858, Bz—25681); Dommers 84 (Bz—24847), 144 (Bz—24853). Paliat: Backer 29379 (Bz—24848). Saboenting: Backer 29769 (Bz—24849). Sepapan: Backer 28521 (Bz—24851, Bz—24852). LESSER SUNDA ISLANDS: Bali: Becking 59 (Bz—24863), 68 (Bz—24862). Banka: Anta 340 (Bz—72690), 379 (Bz—72688), 442 (Bz—72693), 481 (Bz—72691), 775 (Bz—72692), 1211 (Bz—73023); Berkhout 402 (Bz—25008); Bünnemeijer 1467 (Bz—25005), 1497 (Bz—25004), 1890 (Bz—25006); Grashoff 76 (Bz—25009, Bz—25010); Hamzah 71 [Boschproefst. 7263] (Bz—25013); Heyne 5 (Bz—25011); Kobus s.n. (Bz—25012); Kostermans 270 [Boschproefst. BB.34196] (Bz—72934); Mohamad 199 [Boschproefst. BB. 11810] (Bz—25003). Billiton: Heyne 11 (Bz—25014). Lombok: Tjiptosoesilo 5 [Boschproefst. BB.23328] (Bz—24864). Soemba: Iboet 46 (Bz—24865, Ut—93574). Sumbawa: Daroesman 1 [Boschproefst. BB.10329] (Bz—25439); Indir Alam 2 [Boschproefst.

BB.13984] (Bz—24866); *Rensch-Maier 841* (Bz—24867); *Sastrodihardjo 10* [Boschproefst. BB.6922] (Bz—24868). Timor: *Bloembergen 19* [Boschproefst. BB.27071] (Bz—24869); *A. O. de Castro 7* (Bz—24873), *s.n.* (Bz—24871, Bz—24872); *Walsh-Held 237* (Bz—24870). CULTIVATED: Belgium: *Herb. Martius s.n.* [H.B.] (Br). Ceylon: *Alston 344* (K). Hawaiian Islands: *Kelly 246* (Gg—31499). India: *Herb. Hort. Bot. Calcutt. s.n.* (Ed, Le, Mu—639, Mu—1132, V); *Kurz s.n.* [B. H. C.] (Bz—25040); *Wallich 1747* (K), *1747/2* (K, K), *s.n.* (Cp, Cp, Cp, Cp, Cp). Java: *Burger 211* [kweekbed 32; moederplant 80; from Nolte 4001] (Bz—24616), *345* [kweekbed 41; moederplant 80; from Nolte 4001] (Bz—24615); *Groenhart s.n.* [30/8/1939] (Bz—72940, Bz—72941); *Herb. Hort. Bogor. 3012* (Bz-24614), *III* (Bz—24612), *XI.G.109* (Bz—25808, N), *XI.G.109a* (Bz, Bz), *XI.J.5* (Bz—25847, Bz, N, Ut, Ut), *XI.K.13* (Bz—25860, Bz—25861, Bz—25862, Bz—25863, Bz—26590, Oa, Oa), *XI.K.22* (Bz—24613, Bz—25665), *s.n.* (Bz—24617, Bz—24618, Ut—58761, Ut—58762); *E. D. Merrill s.n.* [Nov. 1902] (N); *Zollinger s.n.* [Horti Bogoriensis, 1846] (Br). Madagascar: *Boivin s.n.* [Hort. Bot. 1847—1852] (P). Réunion: *Bréon s.n.* [Bourbon] (P). Selangor: *Hamid 4915* (K). Singapore: *Nur s.n.* [Economic Gardens, 9 Sept. 1924] (Ba, Ba). Thailand: *Kerr 4455* (K). LOCALITY OF COLLECTION UNDETERMINED: *Herb. Meisner s.n.* (M); *F. Mueller s. n.* (Ut—49899).

VITEX PINNATA var. ALATA Moldenke, Phytologia 3: 120. 1949.

Literature: Moldenke, Phytologia 3: 120. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 137 & 202. 1949.

This variety differs from the typical form of the species in having the petioles usually more or less broadly winged.

The type of the variety was collected by Eugene Poilane (*no. 2751*) at Nhatrung, Annam, Indochina, on March 9, 1922, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. The Stockholm sheet of *Pierre 5216* has only one of the five petioles on the specimen winged, but a duplicate was identified by Dop as "*V. limonifolia* Wall.", characterized by its alate petioles, so I assume that most, at least, of the petioles on the collection are alate. It is possible that the variety is only a juvenile state of the species, as has been proved to be the case with the alate form of *V. altissima* L.f.

Citations: INDOCHINA: Annam: *Pierre 5216* (S); *Poilane 2751* (F—photo of type, N—photo of type, S—type, Sg—photo of type, Z—photo of type), *6259* (Bz—72856, Bz—72857), *6843* (Bz—72936, N). Cambodia: *Chatelton s.n.* (Bz—72855). JAVA: *Backer 24667* (Bz—24691).

VITEX PINNATA f. ANOMALA Moldenke, Phytologia 4: 184. 1953.

This form differs from the typical form of the species in having the leaves mostly 1-foliolate, sometimes 2-foliolate, even when mature.

The type of this form was collected by H. A. B. Bünnemeijer (no. 1362) at Muntok, Banka, in the Lesser Sunda Islands, on October 10, 1917, and is deposited in the Herbarium Bogoriense at Buitenzorg. Seedlings of the ordinary form of the species apparently also show this character of 1- or 2-foliolate leaves [cfr. Burger 211 and 345, cultivated at the Buitenzorg Botanical Garden], but in the case of the seedlings the leaflets are decidedly serrate-dentate when in this condition. The present form appears to be a mature plant and the leaflets are entire.

Citations: LESSER SUNDA ISLANDS: Banka: Bünnemeijer 1362 (Bz-25007—type, N—photo of type, Z—photo of type).

VITEX POBEGUINI Aubrév., Fl. Forest. Soudano-Guin. 502. 1950.

Literature: Aubrév., Fl. Forest. Soudano-Guin. 502. 1950; Salisb., Ind. Kew. Suppl. 11: 265. 1953.

I know nothing about this species except that the name appears in a key in the work cited above. Presumably it is native to French Guinea and French Soudan.

VITEX POGGEI Gürke in Engl., Bot. Jahrb. 18: 168. 1893.

Literature: Gürke in Engl., Bot. Jahrb. 18: 168. 1893; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 329. 1900; Durand, Syllog. Fl. Congol. 437. 1909; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 52, 73, & 84, pl. 11. 1928; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 76. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 202. 1949.

Illustrations: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 11. 1928.

A shrub; branchlets glabrous; leaves 5-foliolate, long-petiolate; leaflets short-petiolulate, the blades coriaceous, oblong, acute or acuminate at the apex, quite glabrous on both surfaces, the central one 15—17.5 cm. long and 5—6.5 cm. wide, usually about 2 1/2 times as long as wide; cymes axillary, long-pedunculate, lax, few-flowered; pedicels short; bractlets linear; calyx campanulate, about 6 mm. long, pubescent, its rim dentate, the teeth deltoid, about 2 mm. long, half as long as the tube; fruit drupaceous, globose, pubescent at the apex.

The species is based on a specimen collected by Karl Pogge (no. 1255) — in whose honor it is named — probably in Lunda, Belgian Congo, or in Angola, between 1882 and 1894.

VITEX POLYGAMA Cham., Linnaea 7: 371--373. 1832.

Synonymy: Casarettoa mollissima Walp., Repert. 4: 91. 1844. Vitex polygama var. holosericea Schau. in Mart., Fl. Bras. 9: 300—301. 1851. Vitex polygama Cham. & Schlecht. ex Turcz., Bull. Soc. Nat. Imp. Mosc. 36 (2): 225. 1863. Ildefonsia digitata Schott f. ex Moldenke, Prelim. Alph. List Invalid Names 28, in syn. 1940. Vitex taroma Clausen ex Moldenke, Prelim. Alph.

List Invalid Names 52, in syn. 1940. Vitex lanata Cham., in herb. [not V. lanata Sessé & Moc., 1940]. Vitex flavens Kit., in herb. [not V. flavens H.B.K., 1818]. Vitex polygania Cham., in herb.

Literature: H.B.K., Nov. Gen. & Sp. Pl. 2: 246. 1818; Cham., Linnaea 7: 371--373. 1832; Walp., Repert. 4: 91. 1844; Schau. in A. DC., Prodr. 11: 693. 1847; Schau. in Mart., Fl. Bras. 9: 300-301. 1851; Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (2): 225. 1863; Hayek, Denkschr. Kais. Akad. Wissen. Math.-nat. 79 (1): 296. 1908; Glaz., Bull. Soc. Bot. France Mém. 3: 547. 1911; F. C. Hoehne, Bot. e Agr. Bras. Sec. XVI: 243 & 357. 1937; Moldenke, Alph. List Common Names 21, 29, & 31. 1939; Moldenke, Geogr. Distrib. Avicenn. 27 & 40. 1939; Moldenke, Prelim. Alph. List Invalid Names 14, 28, 51, & 52. 1940; Hoehne, Kuhlmann, & Handro, O Jard. Bot. S. Paulo 579. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39, 75, & 104. 1942; M. Kuhlmann, Instit. Bot. Observ. Ger. Contrib. 5: 19 & VIII. 1942; Moldenke, Alph. List Invalid Names 12 & 27. 1942; Moldenke, Phytologia 2: 121. 1944; F. C. Hoehne, Frut. Indig. 79. 1946; Kuhlmann & Kühn, Fl. Distr. Ibiti 117 & 182. 1947; F. C. Hoehne, Relat. Anual Inst. Bot. 87. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95, 166, & 202. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mexico 20: 15. 1949: Stellfeld, Trib. Farmac. 19 (10): 170--171. 1951.

Shrub or tree, to 20 m. tall; trunk to 15 cm. in diameter; branches rather stout, gray-brown, subterete or very obtusely tetragonal-flattened, medullose, short-pubescent throughout, less so in age, mostly somewhat ampliate at the nodes; branchlets and twigs mostly medium-stout, usually conspicuously flattened, ampliate at the nodes, densely tomentose or villose with flavescent, ferruginous, or sordid (often velutinous) hairs; nodes usually rather obscurely annulate; principal internodes 1--9.5 cm. long; leaves decussate-opposite, 5- (rarely 3-) foliolate, practically mature (at least as to size) at time of anthesis; petioles stout, 3.5--17 cm. long, densely tomentose or villous like the twigs, convex beneath, flattened above, often somewhat compressed, usually discoid at the apex, slightly ampliate at the base; leaflets subequal or the two lowermost somewhat smaller or even considerably reduced, all usually short-petiolulate with petiolules 1--14 mm. long, those on the central leaflets often considerably longer than the lateral ones, all more or less margined and densely tomentose or villose like the twigs; leaflet-blades submembranous or thin-chartaceous when young, subcoriaceous in age, dark-green above (often brunnescent in drying), sordid-yellowish or ferruginous beneath, the central one elliptic or oblong, varying to slightly subobovate or obovate, 5.5--22 cm. long, 1.7--10 cm. wide, acute or short-acuminate at the apex, entire or slightly undulate-repand along the margins (rarely coarsely serrate on shoots), acute or acuminate at the base, densely short-pubescent or velutinous above, very densely matted-tomentose or villous with sordid, yellowish, or ferruginous hairs beneath, the lateral ones similar to the central one in all respects except size and sometimes more or less asymmetrical or inequilateral; midrib slender, flat or subimpressed and usually more densely pubescent above, prominent beneath; secondaries slender, 8--17 per side, arcuate-ascending, often rather straight or arcuate only near the margins, flat or subimpressed above, prominulent beneath, often hidden in the dense tomentum, rather obscurely joined at the margins; vein and veinlet reticulation abundant, obscure or indiscernible above (on young leaves) or subimpressed (on old leaves), only the larger portions prominulent beneath, usually hidden by the tomentum; inflorescence axillary, cymose, abundant, 3.5--7.5 cm. long, 2--4.5 cm. wide, usually rather few-flowered but dense, 1 or 2 times furcate, conspicuously bracteolate, densely tomentose, subvillous, or long-pubescent throughout with sordid, yellowish, or ferruginous hairs (often velutinous when young); peduncles slender or stoutish, to 5 cm. long or very much reduced, usually decidedly flattened, tomentose or villous like the twigs; pedicels stout and to 1 mm. long or obsolete; bractlets numerous, oblong or lanceolate, to 2 cm. long and 3 mm. wide, sessile, dark above, light beneath, densely pubescent; prophylla linear, obscured by the bractlets and the large sessile or subsessile flowers; calyx herbaceous, campanulate or obconic, densely velutinous-villous with flavescent or ferruginous hairs, the tube 6--8 mm. long, 4--6 mm. wide, its rim deeply 5-lobed, the lobes lanceolate, 2--4.8 mm. long, long-acuminate; corolla hypocrateriform, varying from blue or pale-violet to rose, white or yellow in the throat, its tube broadly cylindric, about 1.5 cm. long, 3.5--5 mm. wide, very slightly ampliate at the apex, densely flavescent-tomentellous above the calyx on the outside, its limb 1--1.5 cm. wide, conspicuously 2-lipped, the 4 smaller lobes oblong-lanceolate, about 5 mm. long, obtuse, the central lower lobe much enlarged, about 1 cm. long and 6--7 mm. wide, undulate-crisped along the margins, bearded toward the base, otherwise puberulent on both surfaces; stamens and style exserted about 5 mm. from the corolla-throat; fruiting-calyx thin-textured, hardly changed, brunnescent inside, its 5 lobes about 5 mm. long, densely pubescent on both surfaces; fruit drupaceous, black or reddish-black, elliptic or spherical, succulent, to about 1.5 cm. long and wide.

This widespread and well-known Brazilian species was based by Chamisso on three Sellow collections, one marked "⚥", one marked "♀", and the third in fruit. Walpers cites *Clausen 396* in his original publication of *Casarettoa mollissima*, but actually this name is merely a new name for Chamisso's *Vitex polygama* and therefor is based on the same cotypes as the latter name. Glaziou, in the reference cited above, given in addition to the numbers cited below his numbers *5959*, *7788*, and *14344* for this species. The last-mentioned of these is probably a typographic error for number *15344*, cited below, while *5959* is actually the type collection of var. *glaziovii* Moldenke and *7788* is var. *hirsuta* Schau. Schauer cites a Riedel collection in the Leningrad herbarium from São Paulo and *Blanchet 3434*, but the latter is *V. rufescens* A. L. Juss. In fact, *V. rufescens* is often regarded as being conspecific with *V. polygama*, as, for instance, by Schauer in A. DC., Prodr. 11: 693 (1847), but has proved to be amply distinct. A key for the separation of this from related forms follows:

1. Calyx-rim merely dentate.
2. Leaflets 3, the blades abruptly acute at the base.
3. Pubescence on upper leaflet-surface very long and dense during anthesis........................*V. rufescens*.
3a. Pubescence on upper leaflet-surface sparse during anthesis..................*V. rufescens* var. *abludens*.
2a. Leaflets 5, the blades attenuate to the base.
4. Mature leaflet-blades chartaceous; hairs on the petioles and young leaflets about 1 mm. long.....*V. panshiniana*.
4a. Mature leaflet-blades subcoriaceous; hairs on petioles and young leaflets about 2 mm. long.................... *V. panshiniana* var. *pulchra*.
1a. Calyx deeply lobed or laciniate.
5. Leaflets 3..................................*V. regnelliana*.
5a. Leaflets 5.
6. Pubescence shaggy-hirsute; lower leaflet-surface densely long-hirsute on the midrib and secondaries, sparsely so on the lamina................*V. polygama* var. *hirsuta*.
6a. Pubescence tomentose-villous; lower leaflet-surface villous, tomentose, velutinous, or short-pubescent.
7. Calyx-lobes greatly attenuate, 5—8 or more mm. long.
8. Fruit hard, not fleshy; calyx-lobes lanceolate....... *V. polygama* var. *dusenii*.
8a. Fruit very fleshy; calyx-lobes linear............... *V. polygama* var. *glaziovii*.
7a. Calyx-lobes not greatly attenuate during anthesis, mostly triangular, usually only to 4.8 mm. long.
9. Leaves at anthesis all very immature, very densely flavescent- or rufescent-velutinous throughout..... *V. polygama* var. *warmingii*.
9a. Leaves at anthesis mostly quite fully expanded.
10. Leaflets distinctly petiolulate.......*V. polygama*.
10a. Leaflets sessile, acuminate or attenuate-winged to the base.............*V. polygama* var. *bakeri*.

The best flowers in full anthesis, showing their true large size, are seen on *Dusén 17380*, *Herb. Inst. Butantan 2564*, *Hoehne pl. viv. 163*, and *Mosén 4325*. The transition between thin-chartaceous young leaves (at time of anthesis) to subcoriaceous old ones is well shown on *Herb. Rio de Janeiro 22527* in the United States National Herbarium. The Copenhagen sheet of *Glaziou 5958* exhibits two apparently 2-foliolate leaves, but it seems almost certain that these leaves were 3- or even 5-foliolate originally, as those on all the other examined sheets of this collection are. The size of the bractlets, calyx, calyx-lobes, and corollas and the amount of pubescence on the twigs, petioles, peduncles, leaflets, and inflorescences vary tremendously, as do also the size and fleshiness of the fruit. The leaflets vary from very short- to very long-petiolulate. *Dusén 15401* in the Stockholm herbarium and in the Unitex States National Herbarium exhibits the 3 central leaflets serrate (mostly only above the middle), but these specimens are obviously taken from sterile suckers or shoots.

The species inhabits campos, especially campo cerrado, primeval forests, capoeira, and sandy clearings, ascending to 1500 meters in Minas Gerais. Frambach describes it as "rare", but judging from the wealth of specimens and literature this does not seem to be true, except perhaps locally. It has been collected in anthesis from September to January and in June, and in fruit from December to June. It has been confused in herbaria with *V. taruma* Mart., *V. flavens* H.B.K., *V. montevidensis* Cham., and *V. regnelliana* Moldenke. Hoehne, Kuhlmann, & Handro state that in the São Paulo Botanical Garden it flowers from October to December and fruits from April to June, the fruits being much relished by parrots.

Common names recorded for it are "azetona do campo", "cha de 5 folhas", "maria preta", Maria-Preta", "tarumã", "taruman", "tarumão", "tarumaõ", and "velame do campo". Hoehne, in his Frut. Indig. 79 (1946) says: "Ainda nos recordamos como, quando menino, ficavamos escondidos sob os ramos de árvores do pomar de casa, para esperarmos periquitos que vinham comer essas preciosas negras drupas da 'Maria-Preta' — *Vitex polygama*, que no pomar havia sido poupada, para, entre as fruteiras exóticas, apresentar a fartura para ditos psitacideos. Tão entretidas ficavam as aves no banquete, que podiamos passar-lhes o laço de cerdas de rabo de cavalo por sôbre a cabeça, sem que notassem o movimento da ponta do bambú ou ainda sentissem o instrumento, antes de serem puxadas para baixo. Essas drupas, um pouco maiores do que cerejas, aparecem em tal profusão nesta planta, que ela tôda se mostra negra entre o verde da folhagem."

Kuhlmann & Kühn call the species a hylophyte, and cite *M. Kuhlmann 249* from Alto do Morro, Estação Experimental, a specimen unfortunately not yet seen by me. They also say: "Flores azuis entre Novembro e Dezembro muito procuradas pelas 'Mamangabas' e outras 'Abelhas' silvestres e, provavelmente pela doméestica. Drupas comestíveis, embora del sabor pouco convidativo, com çarocas grandes e pétreos. Há numerosos exemplares desta espécie nativos no Jardim Botanico e Parque do Estado, onde tivemos ocasiao de verificar que, na época do amadurecimento dos frutos, que vae de Marco a Maio, essas arvores sao frequentadas por diversos pássaros frugívoros, como os 'Sabiás' e 'Sanhacos'. Ficamos bastante surpreendidos certa ocasiao quando verificamos que um bando de 'Jacús' nao se intimidava de aproximar-se das habitacoes aíexistentes, atraído pelos frutos de um vetusto 'Taruma', cujos carocos inteiros foram encontrados nas dejecoes. Já os encontramos também nas dejecoes de um CA-NIDEO nao identificado. Só nao os encontramos ainda nos excrementos dos 'Guaribas'. Loefgren....afirma que os frutos do 'Taruma' que cresce a beira dos rios."

Concerning the Campos Novaes 914 and 915, cited below, Hayek says: "Die mir vorliegenden Exemplare sind in Bezug auf Indument und Blattform nicht ganz übereinstimmend. Das eine ist überall dicht seidig filzig, beim zweiten ist das Indument bedeutend weniger dicht und die Blättchen sind schmäler. Doch scheint Vitex polygama diesbezüglich stark zu variieren, wir aus dem mir vorliegenden reichen Material des naturhistorischen Hofmuseums hervorgeht. Die charakteristische Kelchform ist beiden Exemplaren gemeinschaftlich."

Stellfeld says that "cuja madeira é usada para construções civis."

Citations: BRAZIL: Espirito Santo: Saint-Hilaire B^2.256 (P). Federal District: Alston & Lutz 142 (N). Minas Gerais: Ackermann s.n. [Barbacena, 1840] (Br); Black & Mendes Magalhães 51-11955 (Z), 51-11964 (Be—69787); P. Clausen 26 (Bm), 30 (Cb, Dc—888), 396 (B, B, B, B, Bm, Br, Cb, Cb), 1396 (E—116181, V, X), 1453 (P, P, P), 1454 (P, P), s.n. [1840] (B, B, Bm, Br, Br, Br, Br, Br, Cb, F—600403, F—876861, K, N), s.n. [1843] (Bm, V), s.n. (Dc—885); Frambach 110 (Cb, F—670042, N); Herb. Rio de Janeiro 5954 (N); Heringer 51 (N, Sp—39027), s.n. [Nov. 26, 1940; Herb. Rio de Jan. 46732] (N); Martius s.n. [Taboteiro] (Mu—672); Mello Barreto 8113 [Herb. Jard. Bot. Belo Horiz. 23290 & 23291] (F—932773, N), 8115 [Herb. Jard. Bot. Belo Horiz. 23297] (F—933047 10709 [Herb. Jard. Bot. Belo Horiz. 31834] (N), 23291 (N); Mendonca 1274 (B); Mosén 973 (S), 4325 (S); Regnell II.212 [Cabo Verde] (S), II.212 [Caldas, 1842] (P, Ut, Vu), II.212 [1856] (B, Br, Mu—1524), II.212 [1861] (B, K, S, W—274930), II.212 [1864] (Cp, Lu, Ol, Ol), II.212 [1866] (W—1323356), II.212 [Caldas, Sept. 30, 1869] (N, P, P, S), II.212 [1874] (S), II.212c (S, S), II.212e (S, S); Schwacke 8814 (B), 8816 (B); Stephan s.n. (Br); Warming 499 (Cp), s.n. [Lagoa Santa] (Bm, Cp, Cp, Cp, E—116085, It, Le, N, Ol, S, Vt), s.n. [Olho de Pavia] (Ol); Weddell 1260 (P), s.n. [1844] (P); Widgren s.n. [1845] (N, S, W—1323358); Williams & Assis 6732 (G, N). Pará: Ducke 3027 (Cb); J. G. Kuhlmann s.n. [Herb. Rio de Jan. 22527] (B, S, Ut, W—1517707). Paraná: Dusén 10175 (N, S), 15401 (B, S, W—1481792), 16492 (B, Cb, S, S, W—1481793), 17380 (E—908135, G, S). Rio de Janeiro: Glaziou 3680 (Br, Cp, P), 5958 (B, B, Cp, Cp, F—538496, P, P, S, W—1112476), 6049 (B, Cp, P), 11321 (B, Cp, P), 15344 (B, B, Br, Bz—24567, Cp, K, P, P); Miers s.n. (Bm); Schenck 2285 (B). São Paulo: Campos Novaes 914 (Vu, W—389886), 915 (Sp—2215, Vu); Curran 8 (W—920330); Drecker 5 (Sp—42194); Edwall s.n. [São Paulo, Nov. 4, 1893; Herb. Comm. Geogr. & Geol. 655] (Cp, N, Sp—15601); Gaudichaud 276 (P), s.n. [Herb. Imp. Brésil 42]

(P); Guillemin 506 (Cb, P, P); Heiner 271 (N, S, S); Herb. Comm. Geogr. & Geol. s.n. [Herb. Rio de Jan. 31583] (N); Herb. Inst. Butantan 2564 (G); Herb. Lab. Ensaio Mat. Polytec. 4 (K, Sp—32854, Sp); F. C. Hoehne s.n. [Araça, Oct. 27, 1918] (N, Sp—2546); W. Hoehne 1330 (N), 2430 (N); Hoehne & Gehrt s.n. [Campo Largo, Nov. 10, 1936] (N, Sp—36758); Houllet 742 (Br); Kiehl s. n. [Herb. Inst. Agron. Est. S. Paulo 5194] (Sp—44293); Koscinski 3 [Herb. Serv. Florest. 99] (Sf); M. Kuhlmann s.n. [Jardim Botanico, April 1945] (N, Sp); Löfgren s.n. [Hapetininga, Nov. 6, 1887; Herb. Comm. Geogr. & Geol. 318] (Cp, N, Sp—15602); Mosén 3449 (N, P, S, S); F. Noack s.n. [Campinas] (B); Pedroni s. n. [Loreto, Oct.-Nov.; Herb. Serv. Fl. Comp. Paul. Estr. Ferro 199; Herb. Rio de Jan. 31570] (It, N, Sp—15599); D. I. Stehle 1009 (Sf), s.n. [Helvetia, Nov. 10, 1943; Herb. Serv. Florest. S. Paulo 1009] (W—1564394); Tamandaré & Brade 7453 (B, B); A. P. Viégas s.n. [Herb. Inst. Agron. Est. S. Paulo 5310] (Sp—44296). State undetermined: Burchell 4097 (K, K, P); Collector undesignated s.n. [Herb. Jacq.] (V), s.n. (N, V, V); Herb. Martius s.n. (Br); Land s.n. (Cp); Lépone s.n. [Brésil] (N); J. E. Pohl s.n. [Brasilia] (Br, N, V, V, V, V, V, V); Saint-Hilaire 3 (P); Schott 6149 (V); Sellow 267 (B, B, B), 302 (B), 324 (B), 5571 (B, B), s.n. [Brasilia; fructifera; Macbride photos 17565, in part] (B—cotype, B—cotype, F—663044, in part—photo of cotype, Kr—photo of cotype), s.n. [⚥] (B—cotype, B—cotype, B—cotype), s.n. [♀] (B—cotype, B—cotype), s.n. (B, B, B, B); Weddell s.n. [1858] (Cb). CULTIVATED: Brazil: F. C. Hoehne pl. viv. 163 (A, It, N, S, Sp—28546, Ug, Y—23819); Pickel 2135 (N, Sf); Usteri s.n. [Avenida Paulista, Nov. 18, 1906; Herb. Esc. Polit. S. Paulo 249b] (N, Sp—15604).

VITEX POLYGAMA var. BAKERI Moldenke, Alph. List Common Names 20, hyponym (1939); Phytologia 1: 489. 1941.

Literature: Moldenke, Alph. List Common Names 20. 1939; Moldenke, Geogr. Distrib. Avicenn. 27 & 40. 1939; Moldenke, Phytologia 1: 489. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39, 75, & 104. 1942; Moldenke, Phytologia 2: 121. 1944; H. N. & A. L. Moldenke, Plant Life 2: 49. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95, 166, & 202. 1949.

This variety differs from the typical form of the species in its five leaflets being long-acuminate or attenuate at the base and sessile; the pubescence throughout in also usually more silky-velutinous or hirsute and ferruginous.

The type of the variety was collected by Charles Fuller Baker (no. 281) — in whose honor it is named — in the vicinity of Pará, Brazil, on February 20, 1908, and is deposited in the herbarium of the B$_{o}$tanisch Museum at Utrecht. It has been confused with var. hirsuta Schau. by Taubert and with V. flavens H.B.K. by Huber. It has been collected in anthesis in January, February, and July to September. A vernacular name is "mamma cachorro de catinga".

Citations: BRAZIL: Espirito Santo: *Glaziou 11322*, in part (B, Cp, K, N, P). Maranhão: *Lisboâ 2499* (Cb). Pará: *C. F. Baker 281* [Macbride photos 34302] (B—isotype, Bm—isotype, Cb—isotype, F—976257—photo of isotype, K—isotype, Kr—photo of isotype, Le—isotype, Mu—4256—isotype, N—photo of type, N—photo of isotype, P—isotype, Po—64790—isotype, S—isotype, Ut—type, V—isotype, X—isotype, Z—photo of type); *Huber 174* (X, X, X, X, X, X, X, X); *Sampaio 5652* [Herb. Mus. Nac. Rio de Jan. 19244] (B). CULTIVATED: Brazil: *Herb. Amaz. Mus. Para. 9253* (Cb, N); *Glaziou 9985* (K, P).

VITEX POLYGAMA var. DUSENII Moldenke, Geogr. Distrib. Avicenn. 27, nom. nud. (1939); Phytologia 1: 489—490. 1941.

Synonymy: *Vitex organoensis* Briq. ex Moldenke, Prelim. Alph. List Invalid Names 51, in syn. 1940. *Vitex orgaensis* Briq., in herb. *Vitex organensis* Briq., in herb.

Literature: Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Prelim. Alph. List Invalid Names 51. 1940; Moldenke, Phytologia 1: 489—490. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 57. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949; Stellfeld, Trib. Farmac. 19 (10): 170. 1951.

This variety differs from the typical form of the species in its long-attenuate and lanceolate foliaceous calyx-lobes which are 5—8 mm. long or longer and greatly resemble the very conspicuous foliaceous bractlets that surround and equal them in the dense and congested cymes. The fruit is apparently hard, rather than fleshy, and the plant is said to be a tree 5 m. tall.

The type of the variety was collected by Per Karl Hjalmar Dusén (*no. 16111*) — in whose honor it is named — at the margins of *primeval* woods in the littoral region at Jacarehý, Paraná, Brazil, on December 13, 1914, although some specimens of what is obviously the same collection are dated "March 18, 1915", and is deposited in the herbarium of the Botaniska Avdelningen, Naturhistoriska Riksmuseet, at Stockholm. The variety has been collected in anthesis in March and December, and in fruit in January. Mello Barreto records the common name "marie preta". Some sheets of *Gardner 582* are intermediate between this variety and typical *V. polygama* Cham. and also show some characters of var. *hirsuta* Schau. This seems to indicate that the so-called varieties of this species are not very well-defined or constant. Gardner calls it a "large tree with light-blue flowers".

Citations: BRAZIL: Minas Gerais: *Mello Barreto 8115* [Herb. Jard. Bot. Belo Horiz. 23295] (N). Paraná: *Dusén 16111* (B—isotype, Cb—isotype, E—1036549—isotype, E—photo of type, F—668446—isotype, G—isotype, K—isotype, Lu—isotype, N—isotype, N--photo of type, S--type, S--isotype, W--1481794--isotype, Z--photo of type). Rio de Janeiro: G. Gardner 582 [Macbride photos 24703] (Bm, Cb, Cb, Ed, F--24703--photo, F--869099, G, K, K, Kr--photo, M, N, N--photo, S, V, V, W--1066384, X), 582bis (K); Peckolt 292 (V). State undetermined: Bowie & Cunningham A.16 (N, S); Burchell 3461-2 (K, P); Nunes 329 [Herb. Rio de Jan. 47933] (N); Saint-Hilaire 53 (P).

VITEX POLYGAMA var. GLAZIOVII Moldenke, Geogr. Distrib. Avicenn. 27, nom. nud. (1939); Phytologia 1: 490. 1941.

Literature: Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Phytologia 1: 490. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 61. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949.

This variety differs from the typical form of the species in having its calyx-lobes very narrow and elongate, linear or sublinear to oblong, 5—10 mm. long, resembling the bractlets, and in its very fleshy fruits with small central endocarp, the fleshy portion being almost 2 cm. long and wide and the stony endocarp only about 11 mm. long and 6 mm. wide.

The type of this variety was collected by Auguste François Marie Glaziou (no. 5959) — in whose honor it is named — at Restinga de Mauá, in the Organ Mountains, Rio de Janeiro, Brazil, between 1861 and 1887, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. The variety is known thus far only from the original collection.

Citations: BRAZIL: Rio de Janeiro: Glaziou 5959 (B--isotype, K--type, P--isotype).

VITEX POLYGAMA var. HIRSUTA Schau. in Mart., Fl. Bras. 9: 300—301. 1851.

Literature: Schau. in Mart., Fl. Bras. 9: 300—301. 1851; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104 (1942) and [ed. 2], 95 & 202. 1949.

This variety differs from the typical form of the species in having the pubescence on its branchlets, twigs, peduncles, petioles, leaflets, and inflorescences decidedly hirsute, often shaggy. It is mostly much sparser on the leaflet-blades, conspicuously densest on the midrib and secondaries and the ciliate margins. The leaflets are usually also decidedly nigrescent in drying, the blades apparently uniformly membranous.

The variety was based by Schauer on a collection made by Friedrich Sellow near Vittoria, Espirito Santo, Brazil, and one made by Johann Emanuel Pohl (no. 6148) somewhere in Brazil. It has been collected in anthesis in August, September, and November.

Citations: BRAZIL: Espirito Santo: Sellow s.n. [Macbride photos 17565, in part] (B--cotype, B--cotype, F--663044, in part--photo of cotype, Kr--photo of cotype, N--photo of cotype). Minas Gerais: Saint-Hilaire B^{1}.2208 bis, in part (P). Rio de

Janeiro: *Glaziou 7788* (B, Cp, G, K, P, P); *Schwacke 7012* (Cb); *Ule 4344* (B). São Paulo: *Brade 8196* (Ja—22886). State undetermined: *Bowie & Cunningham s.n.* (Bm, Bm, Bm); *Herb. Persoon s.n.* (Le, N); *Herb. Schott s.n.* (Vu); *J. E. Pohl 6148* [Macbride photos 34301] (F—976256—photo of cotype, Kr—photo of cotype, N—cotype, N—photo of cotype, N—photo of cotype, N—photo of cotype, S—photo of cotype, V—cotype, V—cotype, V—photo of cotype, Z—photo of cotype); *Sellow 807* (B), *1029* (B).

VITEX POLYGAMA var. WARMINGII Moldenke, Geogr. Distrib. Avicenn. 27, nom. nud. (1939); Phytologia 1: 490. 1941.

Synonymy: *Vitax polygama* var. *warmingii* Moldenke, Indic. Taxon. Ass. Sudam. Fitotax. 1 (2): 3, sphalm. 1941.

Literature: Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Phytologia 1: 490. 1941; Indic. Taxon. Ass. Sudam. Fitotax. 1 (2): 3. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 88. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949.

This variety differs from the typical form of the species in its leaves being very immature at time of anthesis and equaled in length by the cymes, and the pubescence throughout being very conspicuously flavescent or ferruginous and velutinous-silky, especially on the leaves, where it is very lustrous.

The type of the variety was collected by Johannes Eugenius Bülow Warming (*no. 23/967*) — in whose honor it is named — at Lagoa Santa, Minas Gerais, Brazil. It resembles *V. regnelliana* Moldenke very much in habit, general appearance, and pubescence, but the leaflets are uniformly 5, instead of only 3 as in that species.

Citations: BRAZIL: Minas Gerais: *P. Clausen 205*, in part (P); *Mello Barreto 9506* (Ja—32264); *Regnell II.212* [1869], in part (P); *Warming 23/967* (Cp—type, N—photo of type, Z—photo of type), *s.n.* [Lagoa Santa] (Bm, N—photo, Z—photo); *Weddell s.n.* (N). State undetermined: *J. E. Pohl 6057* (N, V, V).

VITEX POOARA Corbishley, Kew Bull. 1920: 333. 1920.

Literature: Corbishley, Kew Bull. 1920: 333. 1920; E. E. Galpin, Bot. Surv. S. Afr. Mem. 7: 23, 25, & 26. 1925; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 47, 60, & 84. 1928; I. C. Verdoorn, Union S. Afr. Dept. Agr. & Forest. Bull. 185: 45—46. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51, 52, & 104 (1942) and [ed. 2], 120, 122, & 202. 1949.

A small shrubby tree, to 5 m. tall; trunk to 15 cm. in diameter; branches spreading; leaves 5—7-foliolate; petioles as long as or longer than the central leaflet, tomentose; leaflet-blades obovate, 2.5—8 cm. long, 0.6—4 cm. wide, more or less pubescent; inflorescence axillary, cymose; peduncles and pedicels tomentose; calyx campanulate, about 2.5 mm. long during anthesis, persistently tomentose outside, the rim shortly 5-

lobed; corolla varying from mauve or bluish-mauve to violet or brilliant purple, bilabiate, about 8 mm. long; fruiting-calyx enlarged, about 6 mm. long, cupuliform, persistent, sometimes like an acorn cup; fruit drupaceous, very dark-purple or black when ripe, about 1.8 cm. long and 8 mm. wide, edible, the juice staining dark-purple or black.

The species is said to be occasional in sand veld "on the southwestern border of the flats", according to Galpin. Verdoorn says it is plentiful in the Waterberg and it has been recorded from the Zoutpansberg district. Mogg & Phillips found in growing on quartz conglomerate at an altitude of 3200 feet. It is the only species in Transvaal to bear edible fruit. Reports indicate that in the proper season the lips of the natives are stained purplish-black from eating quantities of this fruit. The timber, however, is reported to be of no value. Common names recorded are "mphuru", "pooara", "stinkbessie", and "stinkbossie". It has been collected in anthesis in February. It has been identified as "*V. madiensis* var." by Chase, while Dr. Meeuse, in a letter to me dated December 9, 1953, indicates his belief that it is conspecific with *V. harveyana* H. H. W. Pearson. Pieper cites in addition *Burtt-Davy 1722*, *Pole-Evans 19671*, and *Rehmann 5466* from Transvaal.

Citations: SOUTHERN RHODESIA: *N. C. Chase 1965* (N, Rh--27164); *Levy 73* [Herb. Queen Victoria Memorial 7974] (La, N--photo, Rh, Z--photo). UNION OF SOUTH AFRICA: Transvaal: *L. E. Codd 983* (Z); *Mogg & Phillips s.n.* (Z).

VITEX PSEUDOCHRYSOCARPA Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 68 & 84, pl. 9. 1928; Fedde, Repert. 26: 164--165. 1929.

Synonymy: *Vitex chrysocarpa* Baker, in part, ex Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 68, in syn. 1928 [not *V. chrysocarpa* Planch., 1849, nor DC., 1940].

Literature: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 325. 1900; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 50, 68, & 84, pl. 9. 1928; Pieper in Fedde, Repert. 26: 164--165. 1929; Hill, Ind. Kew. Suppl. 8: 249. 1933; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 47 & 104 (1942) and [ed. 2], 113 & 202. 1949.

Illustrations: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 9. 1928.

Branchlets obtusely angular, flavescent-tomentose when young; leaves 3-foliolate; petioles 2--4 cm. long; leaflets to 8 cm. long and 4 cm. wide, crenate or entire along the margins, villous above, tomentose and glandulose beneath, finally more or less glabrescent, the central one obovate, cuneate at the base, borne on a short petiolule, the lateral ones obovate-elliptic and subsessile; inflorescence axillary, cymose, dense, few-flowered; bracts and bractlets broadly lanceolate, velutinous; flowers large, to 1.5 cm. long; calyx campanulate, about 6 mm. long, tomentose, deeply 5-parted, the teeth equal, to 2.5 mm. long, acute at the apex; corolla short-tubular, glandulose outside, pilose and glandulose on the lobes, the lobes large, reflexed; filaments and style long-exserted; ovary lageniform, long-pilose at the apex.

The type of the species is *Dabjiel 771*, collected at Abinsi, Northern Nigeria. Pieper cites also *Barter 1214* from Nupe, Northern Nigeria. It has been found at altitudes of 1600 meters in the Belgian Congo and was identified as "*Leguminosae*" by Quarré.

Citations: FRENCH WEST AFRICA: French Soudan: *A. Chevalier 511* (Br). NORTHERN NIGERIA: *C. Barter 1214* (T). BELGIAN CONGO: *Quarré 5986* (Br).

VITEX PSEUDOCUSPIDATA Mildbr. in Von Mecklenb., Ergebn. Deutsch. Zentral-Afrik. Exped. 2: 62, hyponym. 1910-1911; Pieper in Fedde, Repert. 26: 163. 1929.

Literature: Mildbr. in Von Mecklenb., Ergebn. Deutsch. Zentral-Afrik. Exped. 2: 62. 1910-1911; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 32, 58, & 84. 1928; Pieper in Fedde, Repert. 26: 163. 1929; Hill, Ind. Kew. Suppl. 8: 249. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 202. 1949.

Small tree; branchlets tetragonal, long-curvate, sparsely fuscous-villous with light red-brown hair, especially when young; leaves 5-foliolate; petioles 8—10 cm. long, fuscous-villous with light red-brown hair; leaflets short-petiolulate, the blades obovate, 8—13 cm. long, 4—6 cm. wide, acuminate at the apex, entire, cuneate at the base, subglabrous and glandulose beneath or hirsute on the venation, sparsely pilose above; inflorescence axillary, large, to 20 cm. wide, loosely cymose; peduncles about 15 cm. long; bractlets linear, to 5 mm. long; flowers about 6 mm. long; calyx campanulate, slightly zygomorphic, 2—2.5 mm. long, glandulose and pilose-pubescent with light red-brown hairs, the rim distinctly 5-dentate, the teeth 1/5—1/4 the length of the calyx; corolla ochroleucous, the lower lip pale-violet, about 5 mm. long, glandulose and pilose-pubescent like the calyx; ovary globose, glabrous, more or less glandulose; fruiting-calyx and fruit not known.

The species is based on *Mildbraed 4655* from Jukaduma, Molundu district, southern Cameroons, and is known only from the original collection.

VITEX PSEUDOLEA Rusby, Mem. New York Bot. Gard. 7: 341—342. 1927.

Literature: Rusby, Mem. New York Bot. Gard. 7: 341—342. 1927; Moldenke, Alph. List Common Names 1, 2, 29, 30, & 33. 1939; Moldenke, Geogr. Distrib. Avicenn. 28. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 40 & 104. 1942; Moldenke, Phytologia 2: 121. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 98 & 202. 1949.

Tree, to 15 m. tall, flowering before the leaves appear; branchlets medium-textured, rather heavy, obtusely tetragonal, light-gray or white, minutely and obscurely puberulent on the youngest parts, soon glabrescent; twigs slender, obtusely tetragonal, brown or purplish in drying, densely cinereous- or sordid-puberulent, more sparsely so in age; nodes not noticeably annulate on older wood, rather obscurely annulate with a somewhat denser band of puberulence on young twigs; principal internodes 0.5--3 cm. long or even more abbreviated, mostly short; leaf-scars rather large, corky, and prominent; leaves decussate-opposite, 5-foliolate; petioles slender, 5.5--10 cm. long, rather densely short grayish-pubescent or -puberulent, convex beneath, conspicuously flattened above, not noticeably ampliate at the base nor disciform at the apex; leaflets subequal or unequal, the lowermost often much smaller, all petiolulate on petiolules that are slender, puberulent, canaliculate-margined, and 2--22 mm. long; leaflet-blades thin-chartaceous or membranous, rather uniformly bright-green on both surfaces (or brunnescent in drying when immature) or slightly lighter beneath, shiny above when mature, the central one elliptic-oblanceolate, 7--15 cm. long, 2.5--6.2 cm. wide, acuminate at the apex, entire, rather cuneately attenuate at the base, very minutely puberulent on both surfaces or glabrescent; midrib slender, slightly subimpressed above, prominent beneath; secondaries slender, 10--20 per side, close together, ascending, rather straight, rather obscurely arcuate-joined at the margins beneath, mostly flat above, prominulent beneath; vein and veinlet reticulation abundant, fine and delicate, obscurely subprominulent on both surfaces; inflorescence axillary, cymose, abundant, crowded on the young twigs, blooming before the leaves are expanded, 4--6 cm. long, 2.5--4 cm. wide, about 3 times dichotomous, widely spreading, with widely divaricate and loosely many-flowered branches, minutely but rather densely canescent-puberulent throughout; peduncles slender, 1.5--2.7 cm. long, violet-green when fresh, flattened, rather densely puberulent, often slightly ampliate and annulate with a band of denser puberulence at the apex; cyme-branches flattened, slightly ampliate and annulate at the apex like the peduncles; pedicels slender, 1--3 mm. long, canescent-puberulent; bracts apparently none; bractlets and prophylla linear, 1--3 mm. long, puberulent; calyx violet-green; corolla blue or lilac, the larger petal darker in color; stamens blue; filaments translucent; fruit red, almost black when mature, edible, about the size of and with the taste of an olive (*Olea europaea*).

The type of this species was collected by Orland Emile White (*no. 767*) at an altitude of 1000 feet at Rurrenabaque, La Paz, Bolivia, on October 4, 1921, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species is very closely related to *V. cymosa* Bert. and may prove to be conspecific with it. It has been found in tropical forests from 200 to 465 meters altitude, in flower in September and in fruit in October and December. The bark is said to be medicinal and the fruit is eaten like cultivated olives. Recorded common names are "aceituno del monte", "anacahiute", "anacahuita", "tarumá", "torumar", and "wild olive".

Citations: PERU: San Martin: Ferreyra 4829 (W—1998618). BOLIVIA: La Paz: New York Bot. Gard. Econom. Mus. 3974.2 (N); O. E. White 767 (K—isotype, N—type, W—1185815—isotype), 1079 (K, Mi, N, W—1232301); R. S. Williams 523 (Bm, K, N). Santa Cruz: Peredo s.n. [Cobezas, Oct. 2, 1945] (N); Steinbach 2832 [Herb. Inst. Miguel Lillo 38004] (B, N, N, N), 6428 (B, Bm, Ca—368506, Cb, D—653030, E—943867, E—943868, Ed, F—565520, G, K, N, S, Ut).

VITEX PUBERULA J. G. Baker in Thiselt-Dyer, Fl. Trop. Afr. 5: 330. 1900.

Synonymy: Vitex doniana var.? pumila Hiern, Cat. Afr. Pl. Welw. 4: 837. 1900.

Literature: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 330. 1900; Hiern, Cat. Afr. Pl. Welw. 1 (4): 837. 1900; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 43, 56, 82, & 84. 1928; Moldenke, Alph. List Invalid Names 53. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 104 (1942) and [ed. 2], 119 & 202. 1949.

A tree; branchlets short-pubescent, the hairs drab; leaves 5-foliolate; petioles 5—7.5 cm. long; leaflet-blades coriaceous, obovate-cuneate, obtuse at the apex, distinctly petiolulate, green and glabrous above when mature, pubescent beneath, the central one about 7.5 cm. long and 3.5 cm. wide; inflorescence axillary, cymose, short-pedunculate, the branches finely pubescent; calyx campanulate, about 2 mm. long, pubescent, its rim dentate with distinct deltoid teeth; corolla small; fruit not known.

The type of this species was collected by Frederich Martin Josef Welwitsch (no. 5668) in the province of Pungo Andongo, Angola. Hiern and Pieper cite, in addition, Welwitsch 5747 from the same area.

VITEX PULCHRA Moldenke, Phytologia 3: 445—446. 1951.

Shrub; branchlets stout, medullose, densely flavescent-villous with antrorse hairs; principal internodes apparently abbreviated; leaves decussate-opposite, 6-foliolate; petioles stout, 7—13 cm. long, densely ferruginous-villosulous with subappressed antrorse hairs much shorter than those on the branchlets; petiolules rather stoutish, 0.5—2 cm. long, irregular in length, very densely ferruginous-villosulous with short antrorse hairs; leaflet-blades coriaceous, grayish-green above, ferruginous beneath, minutely scabridous above when mature, more or less densely pilose-pubescent when young, very densely ferruginous-pubescent beneath, narrow-elliptic or oblanceolate, the central one 8.5—15 cm. long and 2.5—4 cm. wide, the lower ones smaller, acute or very shortly acuminate at the apex, entire but usually conspicuously undulate-crisped along the margins, varying from acute to obtuse or rounded at the base, sometimes asymmetric; midrib rather coarse, impressed and usually ferruginous-pubescent above, very conspicuously rounded-prominent beneath; secondaries slender, 8—12 per side, more or less impressed above (at least on larger leaves), sharply prominent beneath, divaricate-ascending, irregularly arcuate-joined in many small loops near the margins beneath; veinlet reticulation abundant, varying from subprominulous above on smaller leaves to impressed on larger ones, sharply prominulous beneath; inflorescence axillary, sessile, very densely many-flowered and congested; peduncles obsolete; pedicels much abbreviated or obsolete, very densely flavescent-villous; bractlets elongate, linear, to 1 cm. long, glabrous and nigrescent on one surface, very densely flavescent-villous on the other surface; calyx campanulate, 7—8 mm. long, about 5 mm. wide at the apex, very densely fulvous-villous on the outside with long antrorsely subappressed hairs, the rim shortly 5-dentate, the teeth about 1 mm. long; corolla dark-red, tubular, about 2.5 cm. long, incurved, very densely long-villous on the outside with subappressed, long, sordid-silvery hairs, the lobes about 2 mm. long; stamens and pistil exserted about 1 cm. from the corolla-mouth.

The type of this handsome species was collected by Henri Perrier de la Bâthie (*no. 10238*) in a forest on hills at an altitude of 800 meters, *Anoloinoy*, Madagascar, in January of 1932, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

Citations: MADAGASCAR: *d'Alleizette 1059m* (N, P); *Perrier de la Bâthie 10238* (N—photo of type, P--type, P--isotype, Z—photo of type).

VITEX PYRAMIDATA B. L. Robinson, Proc. Am. Acad. 29: 321. 1894.

Synonymy: *Vitex pyramidata* Robinson & Pringle apud Durand & Jacks., Ind. Kew. Suppl. 1: 457. 1906 [not *V. pyramidata* Millsp., 1907]. *Vitex pentaphylla* Pavon ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940 [not *V. pentaphylla* Merr., 1909, nor Lamb., 1940]. *Vitex pentaphylla* Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940. *Vitex pyramidalis* Robinson ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940. *Vitex trifoliata* Pav. ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940 [not *V. trifoliata* Lam., 1947].

Literature: Robinson & Pringle, Gard. & Forest. 7: 153. April 18, 1894; B. L. Robinson, Proc. Am. Acad. 29: 321. 1894; Durand & Jacks., Ind. Kew. Suppl. 1: 457. 1906; Moldenke, Alph. List Common Names 15, 22, 26, & 30. 1939; Moldenke, Geogr. Distrib. Avicenn. 14. 1939; Moldenke, Carnegie Inst. Wash. Publ. 522: 208 & 210. 1940; Moldenke, Prelim. Alph. List Invalid Names 52. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 19 & 104. 1942; H. S. Gentry, Carnegie Inst. Wash. Publ. 527 [Rio Mayo Pl.]: 42, 64, 66, 223, 224, & 306. 1942; Moldenke, Alph. List Invalid Names 54—55. 1942; Moldenke, Phytologia 2: 121. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 34 & 202. 1949; F. Miranda, Veget. Chiapas 1: 99 (1952) and 2:

303 & 392. 1953.

Divaricately branched shrub or small bushy or round spreading tree, to 35 m. tall, densely and intricately branched; stems several; bark smooth, gray; branchlets rather stout, medullose, dichotomous, obtusely tetragonal, grayish-brown or buff, minutely puberulent, becoming glabrate in age; twigs slender or stoutish, acutely or obtusely tetragonal, often slightly sulcate, medullose, usually densely puberulent with sordid-gray hairs; nodes annulate; principal internodes 1—3.5 cm. long; leaf-scars rather large, usually not very corky nor prominent (except sometimes the edges); leaves decussate-opposite, 5-foliolate (rarely 3-foliolate); petioles slender or stout, 4.5—10 cm. long, convex beneath, conspicuously flattened above, often submargined, usually not noticeably ampliate at the base, disciform at the apex, puberulent throughout with minute and rather sparse grayish or sordid hairs; leaflets usually unequal in size, the 2 lowermost decidedly smaller than the 3 central ones, all rather long-petiolulate on slender or stoutish, puberulent, distinctly canaliculate and margined petiolules 2—22 mm. long, all the petiolules normally equal in length or the 2 lowermost somewhat shorter; leaflet-blades thin-chartaceous or submembranous during anthesis, subcoriaceous or coriaceous in age, bright- or grayish-green above (usually brunnescent or very dark in drying when immature), much lighter or sordid-gray beneath, the central one oblong or elliptic, varying to ovate, 3.5—18 cm. long, 1.7—6.7 cm. wide, rather abruptly acute or rounded at the apex, entire, obtuse to broadly rounded or even subcordate at the base, sparsely pulverulent-puberulent above (more densely so on the midrib and secondaries), becoming subglabrate except for the midrib and secondaries, densely short-pubescent and resinous-granular beneath with cinereous or sordid pubescence, varying to densely and minutely grayish-tomentulose, the lateral ones similar in all respects, but usually smaller; midrib slender, impressed above (especially on mature leaves), prominent beneath; secondaries slender, 7—12 per side, impressed above (especially on mature leaves), very prominent beneath, ascending, usually rather straight, not much arcuate except near the margins where they are arcuately joined; vein and veinlet reticulation fine and abundant, impressed above (especially on mature leaves), prominulous beneath; inflorescence axillary, thyrsoid-paniculate, abundant, often paired in the uppermost axils, 10—26 cm. long, 3—16 cm. wide, mostly composed of 1—4 pairs of lateral long-stalked panicles and a terminal one, each panicle composed of 3—9 rather long-stipitate and many-flowered cymes, densely puberulent throughout; peduncles slender or rather stout, 4—13 cm. long, tetragonal or flattened, puberulent; inflorescence-branches and rachis resembling the peduncles in all respects, but more slender; pedicels very slender, 1—2 mm. long, densely puberulent; bracts often present, large and foliaceous, 3—5-foliolate, long-stipitate, resembling the leaves in color and pubescence; bractlets linear, oblong, lanceolate, or spatulate, 2—4 mm. long, puberulent, sessile; prophylla linear, about 1 mm. long, puberulent; flowers very fragrant; corolla varying from blue or bright-blue to lavender, with a white throat, slightly bilabiate, pilose in the throat; fruit fleshy, black, about 1 cm. in diameter, edible.

The species is based on *Pringle 4429*, collected on rocky hillsides about Tequila, Jalisco, Mexico, on June 29, 1893, and on *Edward Palmer 422*, also collected at Tequila in August of 1886. The species inhabits rocky and sunny hillsides, arroyos, volcanic mountains, the edge of craters, rocky outcroppings and basaltic mesas in short-tree and oak forests, prairies, rather rocky dry spots in low spiny matorral, and rocky ground in general. It has been found among rocks on ridges, sometimes clinging to the arid rocks on sunny open slopes. It is said to be a characteristic plant of the mesas (oak forests) and of the foothills and lower oaks, common on dry rocky slopes with lower oaks and on arid slopes with low scattered trees. It ascends from 350 to 1530 meters altitude, and has been collected in anthesis in February, April, and June to September, and in fruit in June and from August to October. Hinton reports that when burned, the ash is blue. The fruit is edible, under the name of "ahuilote".

The species has been misidentified in herbaria as *V. hemsleyi* Briq. and *V. mollis* H.B.K. Millspaugh identified *Gaumer 607* as *V. pyramidata*, but this collection actually is *V. gaumeri* Greenm. Common names are "hupari", "negrito", "negrito coyote", "querenda", "querendereniqua", "tescalama", "uvalama", "uvulama," and "yashcabté". The name "negrito" is also applied to *Citharexylum berlandieri* B. L. Robinson and "uvalama" to *V. mollis* H.B.K. *Vitex pentaphylla* Lamb. is a synonym of *V. peduncularis* Wall., *V. pentaphylla* Merr. is *V. glabrata* R. Br., *V. pyramidata* Millsp. is *V. gaumeri* Greenm., and *V. trifoliata* Lam. is *V. trifolia* L. The *Gonzalez Ortega 577*, cited below, may perhaps have been collected in Nayarit.

Shreve 6089 has several 3-foliolate leaves, but I believe that the two lowermost leaflets have actually dropped off -- there are two plainly 5-foliolate leaves still remaining on the specimen; the same statement applies to *Liebmann 11347* in the United States National Herbarium. On *Herb. Pavon s.n.* in the Herbier Boissier all the leaves are 3-foliolate, but several plainly show the remains of more petiolules; *Leavenworth & Hoogstraal 1707* also shows only 3-foliolate leaves as mounted. In general, however, the usually heavy leaflets, 5 in number, with deeply impressed venation above and prominent venation beneath, characterize this species quite well. Gentry reports that the flowers are visited by several species of wild bees in large numbers. The fruit is reported by him to be saleable in Sonora at $13 a fanega, marketed in Alamos and Navojoa, and is eaten like that of *V. mollis*. It is said to form an important contribution to the limited diet of the natives. He also states that all the indigenous people rely on this and other native woods for fuel and construction purposes.

Miranda says "arbol hasta de 35 m. de alto con la corteza gris poco rugosa; hojas.....menudamente gris afelpadas debajo... Abundante en silvas altas subdeciduas al Este de Ocosingo. Los frutos son comestibles. La madera es similar a la de Vitex Gaumeri de Yucatán, la cual es de color gris claro, de textura fina, de grano irregular o entrecruzado, con peso de unos 16 kilos por pie cúbico o 560 por metro cúbico; moderadamente dura y fuerte, facie de trabajar, toma buen pulimento y es regularmente durable. Se ha usado para carretas y yugos; a causa de que no raja facilmente se ha recomendado para catres de campaña, bastones de polo y de golf, mangos de cinceles, y posiblemente se pueda emplear para vehículos e instrumentos agrícolas."

Citations: MEXICO: Durango: J. N. Rose 3481 (W--302458), 3487 (W--302464). Guerrero: R. Q. Abbott 141 (N); Hinton 5999 (F--938080, K, N, N), 6956 (K, N), 9990 (K, Ld, N), 10002 (F--938081, K, N), 10005 (F--938058, Fs, K, N, N), 11244 (N, N). Jalisco: Edw. Palmer 129, in part (Vu), 422 (B--cotype, Bm--cotype, C--cotype, E--116173--cotype, F--236893--cotype, G--cotype, K--cotype, Mi--cotype, N--photo of cotype, N--photo of cotype, Os--cotype, P--cotype, Pa--cotype, Us--cotype, W--58244--cotype, X--cotype, Z--photo of cotype, Z--photo of cotype); Pringle 4429 (B--cotype, Bm--cotype, Bm--cotype, Br--cotype, C--cotype, C--cotype, Ca--104856--cotype, Cb--cotype, Cb--cotype, D--cotype, E--116183--cotype, Ed--cotype, F--264319--cotype, G--cotype, J--cotype, K--cotype, Me--cotype, Me--cotype, Me--cotype, Mu--1811-cotype, Ob--50881--cotype, P--cotype, S--cotype, V--cotype, Vt--cotype, Vu--cotype, W--46916--cotype, W--1323357--cotype, X--cotype); B. P. Reko 4435 (Me, W--1268947); Rose & Hough 4754 (W-346745). México: Hinton 720 (K, Me), 740 (K), 3829 (K, N), 4086 (K, K, N, N); Matuda 27914 (Z), 27972 (Cb), 27974 (Cb); Matuda & al. 31387 (Ss). Michoacán: Leavenworth & Hoogstraal 1707 (Ur). Nayarit: J. Gonzalez Ortega 107 (Me), 451 (Me); J. N. Rose 1485 (F--600841, G, K, K, N, W--300322, W--300323), 3304 (W--302280). Sinaloa: T. S. Brandegee s.n. [Oct. 1904] (Ca--169231, W--873713); H. S. Gentry 5073 (Ak--20404, Du--277961, N); J. Gonzalez Ortega 577 (K), 4028 (W--1169117); M. E. Jones 23498 (N); Mexia 397 (Gg--142024); Nervaez Montes & Salazar 577 (W--1035408); Thejo 1096 (W--1035683). Sonora: H. S. Gentry 2256 (Ca--582116, F--861636, Fs, Ge, Me, S), 2952 (Ca--582089, F--862364, Fs, Ge, S); Herb. Inst. Biol. Univ. Nac. Mex. 4909 (Me); Rose, Standley, & Russell 12884 (N, W--635701); Shreve 6089, in part (F--682950). Yucatán: Gaumer & sons 607 (Du--206175). State undetermined: Beechey s.n. (K); Collector undesignated 1052 (Me), s.n. (P, P); Ehrenberg 248 [Chanzingo] (B); Haenke 961 (F--834789), 1524 (N); Herb. Pavon s.n. [Nueva España] (I, X); Liebmann 11347 (Cp, N, W--1315102); Edw. Palmer 1599 [Lodiego] (Cp, F--222585, G, N, W--305437); Schnée s.n. (P); Sessé, Moçiño, Castillo, & Maldonado 2186 (F--847135, Q).

VITEX QUINATA (Lour.) F. N. Will., Bull. Herb. Boiss., sér. 2, 5: 431. 1905.

Synonymy: Cornutia quinata Lour., Fl. Cochinch., ed. 1, 387. 1790. Vitex heterophylla Roxb., Hort. Beng. 46, hyponym. 1814; Fl. Ind., ed. 2, 3: 75. 1832 [not V. heterophylla Blume, 1858, nor Schau., 1919]. Vitex babula Buch.-Ham. ex Wall., Numer. List [48], no. 1745, hyponym. 1829. Vitex undulata Wall., Numer. List [48], no. 1756, hyponym. 1829. Vitex loureiri Hook. & Arn., Bot. Beech. Voy. 206, pl. 48. 1836 [not V. loureiri Wight, 1942]. Vitex loureirii Hook. & Arn. ex Schau. in A. DC., Prodr. 11: 686. 1847 [not V. loureirii Wight, 1885]. Vitex heterophylla var. undulata (Wall.) C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 585. 1885. Vitex quinata (Lour.) Druce, Rep. Bot. Exch. Club Brit. Isles 1916: 652. 1917 [not V. quinata Schumacher, 1940]. Vitex quinata Williams ex Lévl., Cat. Pl. Yun-Nan 278. 1917. Vitex heterophylla var. typica H. J. Lam, Verbenac. Malay. Arch. 188. 1919. Vitex negundo Lour. ex Crevost & Pételot, Bull. Econom. Indo-chine 37: 1294, in syn. 1934 [not V. negundo L., 1753, nor Willd., 1918]. Vitex heterophyllum Roxb. ex Biswas, Indian Forest Rec. Bot., new ser., 3: 42. 1941. Vitex heterophyllum var. undulata Clarke ex Biswas, Indian Forest Rec. Bot., new ser., 3: 42. 1941. Vitex quinota (Lour.) F. N. Will. ex Moldenke, Alph. List Invalid Names 55, in syn. 1942. Vitex quinaria Will. ex Moldenke, Alph. List Invalid Names Suppl. 1: 29, in syn. 1947. Vitex heterophylla Williams ex Moldenke, Alph. List Invalid Names Suppl. 1: 28, in syn. 1947. Vitex heterophylla var. genuina Lam, in herb. Vitex quinata (Lour.) Merr., in herb.

Literature: Lour., Fl. Cochinch., ed. 1, 387. 1790; Roxb., Hort. Beng. 46. 1814; Wall., Numer. List [48], nos. 1745 & 1756. 1829; Roxb., Fl. Ind., ed. 2, 3: 75. 1832; Wall., Pl. Asiat. Rar. 3: pl. 226. 1832; Hook. & Arn., Bot. Beech. Voy. 206 (1836), pl. 48. 1841; Moritzi, Syst. Verz. 53. 1845—1846; Schau. in A. DC., Prodr. 11: 686. 1847; Miq., Fl. Ind. Bat. 2: 862--863. 1858; Miq., Fl. Ind. Bat. Suppl. 1: 242 & 567. 1860; Vidal, Sin. Fam. & Gen. Pl. Leñ. Filip. (Introd. Fl. For. Filip.) Atlas pl. 75, fig. B. 1883; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 585. 1885; Forbes & Hemsl., Ind. Fl. Sin. 2: 257. 1890; Koord., Meded. Lands Plant-tuin Buitenz. 19: 560 & 645. 1898; Koord. & Val., Bijdr. Booms. Java 7: 204. 1900; F. N. Will., Bull. Herb. Boiss., sér. 2, 5: 431. 1905; King & Gamble, Journ. As. Soc. Beng. 74: 848. 1909; Koord., Exkursionsfl. Java 3: 137. 1912; Koord. & Val., Atlas Baumart. Java 2: 6, pl. 296. 1914; Druce, Rep. Bot. Exch. Club Brit. Isles 1916: 652. 1917; Heyne, Nutt. Plant. Nederl. Ind., ed. 1, 4: 111 & 113. 1917; Kanehira, Formosan Trees 407. 1917; Lévl., Cat. Pl. Yun-Nan 278. 1917; H. Hallier, Meded. Rijks Herb. Leid. 37: 45. 1918; Van Gorkom, Oost-Ind. Cult., ed. 2, 3: 879. 1919; H. J. Lam, Verbenac. Malay. Arch. 167, 187--189, & 370. 1919; E. H. Wilson, Arn. Arb. Exped. E. Asia 1917-18, pl. N-

452. 1920; Bakh. & Lam, Bull. Jard. Bot. Buitenz., ser. 3, 4 (2): 285. 1922; H. J. Lam, Bull. Jard. Bot. Buitenz., ser. 3, 5 (2): 177—178. 1922; Heyne, Nutt. Plant. Nederl. Ind., ed. 2, 1315 & 1317. 1925; E. H. Walker, Fifty-one Common Ornam. Trees Lingnan Univ. Canton [Lingnan Sci. Journ. 6:] 146. 1930; Stapf, Ind. Lond. 6: 478. 1931; Crevost & Pételot, Bull. Econom. Indo-chine 37: 1294. 1934; Moldenke, Alph. List Common Names 14, 17, 19—21, & 31. 1939; Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Moldenke, Prelim. Alph. List Invalid Names 24 & 50—52. 1940; Moldenke, Suppl. List Common Names 2—4, 7—14, 18, 19, 22, & 24. 1940; Biswas, Indian Forest Rec. Bot., new ser., 3: 42. 1941; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke in A. C. Sm., Sargentia 1: 115. 1942; Moldenke, Alph. List Invalid Names 22 & 52—55. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55—61, 63—67, 69, 75, 80, & 104. 1942; Moldenke, Phytologia 2: 122. 1944; Moldenke, Alph. List Invalid Names Suppl. 1: 28 & 29. 1947; H. N. & A. L. Moldenke, Plant Life 2: 70. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 128, 129, 133, 135, 137—139, 142, 143, 145—148, 151, 166, & 202. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949.

Illustrations: Wall., Pl. Asiat. Rar. 3: pl. 226 (colored). 1832; Hook. & Arn., Bot. Beech. Voy. pl. 48. 1836; Vidal, Sin. Fam. & Gen. Pl. Leñ. Filip. (Introd. Fl. For. Filip.) Atlas pl. 75, fig. B. 1883; Koord. & Val., Atlas Baumart. Java pl. 296. 1914; Kanehira, Formosan Trees 407. 1917; Van Gorkom, Oost-Ind. Cult., ed. 2, 3: 879. 1919; E. H. Wilson, Arn. Arb. Exped. E. Asia 1917-18, pl. N-452. 1920; E. H. Walker, Fifty-one Common Ornam. Trees Lingnan Univ. Canton [Lingnan Sci. Journ. 6:] 146. 1930; Crevost & Pételot, Bull. Econom. Indo-chine 37: 1294. 1934.

Shrub or tree, to 45 m. tall, erect or spreading, handsome; trunk cylindric, to 100 [or 200?] cm. in diameter, often 40—60 cm. in diameter at 15—20 m. up the trunk; bark gray or grayish-brown, finely longitudinally fissured; branches gray-brown, 4-angular, "gray-tomentose"; branchlets and twigs slender, acutely tetragonal, gray or brown to purplish, rather medullose, the youngest parts pulverulent-puberulent, soon becoming glabrate; nodes obscurely or not at all annulate; principal internodes 1.5—5 cm. long; leaves decussate-opposite, 3—5-foliolate; petioles very slender, convex beneath, usually deeply canaliculate above, sparsely and rather obscurely strigillose-pulverulent, becoming glabrous, not ampliate at the base nor disciform at the apex; leaflets usually unequal in size, the central 1 or 3 the largest, the 2 lowermost usually conspicuously reduced, all petiolulate on margined and canaliculate petiolules 1—14 mm. long, the central one usually long-stalked and the lateral ones with much shorter petiolules; leaflet-blades thin-chartaceous, uniformly dark-green on both surfaces or somewhat lighter beneath, sometimes glossy-green above, mostly shiny on both surfaces, the central one oblong-elliptic or oblanceolate to subobovate, 4.5—10 cm. long, 1.7—4 cm. wide, rather long-acuminate or caudate at the apex (the acumination acute or bluntish), entire, acute or acuminate at the base, glabrate but abundantly grayish-punctate above, finely pulverulent-puberulent or glabrate beneath and more or less resinous-granulose, the lateral ones similar but smaller and usually more acute and less petiolulate; midrib slender, flat or subprominulent above, prominent beneath; secondaries slender, 4—12 per side, arcuate-ascending, usually slightly prominulent above, more conspicuously prominulent beneath, arcuately joined near the margins; veins and veinlet reticulation abundant, the larger portions subprominulent on both surfaces; inflorescence terminal (and axillary in the uppermost leaf-axils), paniculate, 6—20 cm. long, about 4 cm. wide, composed of several to many ascending or divergent branches, each composed of many opposite or subopposite pairs of rather few-flowered cymes, densely canescent-puberulent throughout; peduncles 1—3.5 cm. long, mostly acutely tetragonal, often sulcate, more or less densely puberulent; rachis similar to the peduncle in all respects; sympodia usually short; pedicels slender, about 1 mm. long, canescent-puberulent; bracts (when present) few, foliaceous, 3-foliolate, similar to the leaves but smaller in all parts; bractlets and prophylla linear, 1—3 mm. long, puberulent; torus green; calyx green; flowers fragrant; corolla described as blue, light-blue, purple, violet, or "pink and white", varying to whitish, white, "white-purplish", yellowish-green, or yellow, or even "white and yellow", the lower lip violet; stamens 4; filaments whitish-pink; anthers black; pistil whitish-green; fruit green or yellow when immature, purplish-black or black and lustrous when mature, drupaceous.

The tree is said to be fairly common in thickets on dry land in the loam of village commons on Hainan Island or "rare" in thickets on moist gentle slopes in silt-sand of streams. It is found in woods, in forested ravines, rocky thickets, and along streams. It is said to occur scattered in moist loam along roadsides, in the partial shade of light or thin woods, in mixed woods, at the edges of clearings and cleared ravines, on hilltops, and on dry land of wooded hillsides. It is abundant in silt of swamps. On Celebes and other Pacific islands it occurs in primary forests and rainforests and on sea beaches. In Annam it is said to be found in damp forests and commonly in open places along rivers. It ascends from sea level to 1400 meters altitude, and has been collected in anthesis in February and from May to September, in fruit from June to February. A bark specimen can be seen on *Ying 2803* in the Britton Herbarium.

Common names recorded for the species are "arnrai", "basal", "boengis", "chân chim", "flowery lĕban", "gofasa", "hamulaúin", "horn lĕban", "kajoe-gopasa", "kajoe sĕmoet", "kalipápa-asu", "kalipápa-madam", "ka liu tsoi", "ka liu tzoi", "kamalan", "kĕtilĕng", "ki bangbara", "koefo-koefo", "koetilĕng", "kojoe semoet", "laban", "laban kĕtilĕng", "laban loening", "laban sĕmoet", "lĕban boenga", "lĕban bunga", "lĕban tandok", "limolímo", "limpápa", "liñgo-liñgo", "magúpai", "mamali", "man kinh", "masarawet", "masarawèt sĕla", "masarawet-sela", "masarawèt", "mbo", "mbothawa", "mĕdang giring", "moláve-aso, "ndrai tolu", "ngu gia bỉ", "niuə", "rimoewas", "sai tsio tau", "saivonta", "saoe", "saoe masarawèt", "saoe-masarawet", "saoe poeti", "saoe-poeti", "saoe rĕndai", "saoe-rendai", "saoe sèla", "saoe-sela", "shan po king shue", "shek wong king" [=stone-yellow-deer], "tail wong muk" [=big-king-tree], "tileng", "tilĕng", "tugas", "woelas watoe", "yarokasawa", and "ye po keng". Some of these vernacular names, however, are applied to other species as well; for instance, "liñgo-liñgo" and "kalipápamadam" are applied also to *Premna adenosticta* Schau., "gofasa" to *Vitex cofassus* Reinw., "laban" and "lĕban boenga" to *V. pinnata* L., "horn lĕban" and "lĕban tandok" to *V. pinnata* and *V. vestita* Wall., "kamalan" to *Viticipremna philippinensis* (Turcz.) H. J. Lam, "tugas" to *Vitex parviflora* A. L. Juss. and *Viticipremna philippinensis*, "tilĕng" to *Vitex glabrata* R. Br., "kĕtilĕng" to *V. glabrata* and *V. velutina* (Koord. & Val.) Koord., "laban kĕtilĕng" to *V. glabrata* and *V. pinnata*, and "flowery lĕban" and "lĕban bunga" to *V. longisepala* King & Gamble, *V. pinnata*, and *V. vestita*.

I am not at all convinced that all of the specimens cited below are conspecific. For instance, the Dolleschal collection has all its leaves simple and reminds one of *V. cofassus*. The *Clemens 10021*, *10047*, *10150*, *10274*, and *Moulton 6718* all have 3 leaflets and look much like *Teijsmanniodendron coriaceum* (C. B. Clarke) Kosterm. Moulton states that the color of the flowers on his specimen was Saccardo 26. The following collections have their leaflets 3 in number and small in size: *Ching 7309*, *Chun 7745*, *Chun & Tso 43954* & *44673*, *Fung 20420*, *How 71073*, *How & Chun 70248*, *Lau 20143*, *Lei 66*, *Steward & Cheo 807* and *1157*, *Tsang 21194* and *21477*, *Tsiang 2611*, *Wang 33752* and *34267*, and *Ying 770*. *Chun 7456* has 3--5 small leaflets, while *McClure 8041* has 5 small leaflets. The *Mallonga s.n.* collection has 3 to 5 large leaflets, while *Ham. R.5* and *To & Ts'ang s.n.* have 5 large leaflets. The *Forbes 3784* collection from Timor is sterile and badly eaten by insects; it may not be this species. The *M. Ramos 1869* from British North Borneo was identified by Merrill as "a variety with large fruit" — it has five leaflets and the fruit is yellow.

The *V. quinata* Schumacher is a synonym of *V. negundo* L., *V. heterophylla* Blume is *V. pinnata* L., while *V. heterophylla* Schau., *V. loureiri* Wight, *V. loureirii* Hook., and *V. loureirii* Wight are all synonyms of *V. urceolata* C. B. Clarke.

The punctate leaflet-blades serve well, in general, to distinguish *V. quinata* from related species. The secondaries are rather few in number, distant, and conspicuously arcuate in this species, while in the closely related *V. pierreana* Dop they are numerous, close together, almost straight, and parallel. Judd describes the fruit as "berries", but they are actually drupes. The variation in flower-color as noted by collectors is most amazing and may well be due to faulty observation or description. Specimens of V. quinata have been misidentified in herbaria as V. pentaphylla Merr., V. negundo L., V. sumatrana var. urceolata King & Gamble, and even Ardisia sp. The wood is said to be used for making pillars. Heyne says "Het hout wordt in West-Java duurzaam genoemd en voor huisbouw geschikt geacht, maar zelden gebruikt, omdat de stam meestal te diep gegleufd is."

In Sargentia 1: 115 (1942) I cited Degener 14481 as V. quinata, but actually this collection represents var. puberula. Dr. Lam gives "1827" as the date for Wall., Numer. List [48], no. 1745, but, according to the late Dr. J. H. Barnhart, this page did not appear until 1829.

Citations: INDIA: Assam: Chatterjee s.n. (Br). BURMA: Tenasserim: Helfer 6068 (Cp, S, V). CHINA: Chekiang: Ching 1987 (Ba). Fukien: H. H. Chung 5085 (N); Ging 5332 (Gg--154216), 6759 (Gg--154133), 7168 (Mi). Kwangsi: R. C. Ching 7309 (N); Steward & Cheo 807 (Bz--25130, N, S), 1157 (N, S). Kwangtung: N. K. Chun 7745 (Bz--25132, N); Lau 20143 (N); Levine 10 (Io); To & Ts'ang s.n. [Herb. Lingnan Univ. 12613] (La, N); W. T. Tsang 16443 (N), 21194 (N, N, S), 21477 (N, N, S); Tsiang 2611 (N); Y. K. Wang 2803 (N); Ying 770 (Bz--25133), 1066 (Du--250174), 2803 (N). Province undetermined: Dunn s.n. (Cp, Cp, N). HONAM ISLAND: Levine s.n. [Herb. Canton Chr. Coll. 1206] (Ka--62908); E. D. Merrill 9996 (Gg--31497); Ping 1849 [Herb. Canton Chr. Coll. 13674] (Bz--25131). HONGKONG: W. Y. Chun 4981 (Du--200919), 7456 (N); C. Ford s.n. [Little Hong Kong] (N). HAINAN ISLAND: Chun & Tso 43954 (Go, N, S), 44673 (N); Fung 20420 (Bz--25134, N); Gressitt 1053 (Gg--316092, I); F. C. How 70570 (Go), 70858 (Go), 71073 (N); How & Chun 70248 (N); S. K. Lau 16 (I, Mi), 153, in part (I, Mi); Lei 66 (Ba, Bz--25128, N), 714, in part (Ba, N); Liang 62069 (N), 62220 (Go), 62780, in part (Go), 63161 (N), 64495 (N, S), 66530 (N); F. A. McClure 8041 [Herb. Canton Chr. Coll. 8041] (Gg--127989, N); W. T. Tsang 178, in part [Herb. Lingnan Univ. 15677] (N), 223, in part [Herb. Lingnan Univ. 15722] (N, N), 786 [Herb. Lingnan Univ. 18230] (N), 868 [Herb. Lingnan Univ. 16367] (N), 944 [Herb. Lingnan Univ. 16443] (N); C. Wang 32890 (N), 32892 (Go), 33280 (N), 33752, in part (N), 34267, in part (N). INDOCHINA: Annam: Clemens & Clemens 3394 (Gg--156436, Mi); Poilane 11074 (S). MALAYA: Malacca: W. Griffith s.n. [Malacca] (Br). PHILIPPINE ISLANDS: Batan: M. Ramos s.n. [Herb. Philip. Bur. Sci. 80710] (Bz--24510). Mindanao: W. I. Hutchinson s.n. [Herb. Philip. Forest Bur. 11245] (N); Mallonga s.n. [Herb. Philip. Forest Bur. 26007] (Bz--23822); Wenzel 2523 (Au, Br, Bz--25091, N), 2563 (Bz--23821), 2912 (Au, Br, Bz--25092), 3430 (Bz--23820).

Palawan: E. D. Merrill 9330 (Cm). SUMATRA: Buwalda 368 [Boschproefst. BB.28591]. JAVA: Koorders 9840b, in part (Bz—24202). BRITISH NORTH BORNEO: M. K. Clemens 10021 (Ph), 10047 (Ph), 10150 (Ph), 10274 (Ph); M. Ramos 1869 [field no. 800] (Ph). BORNEO: Moulton 6718 (Ph). MOENA ISLAND: Ham R.5 (Bz—23863). LESSER SUNDA ISLANDS: Timor: Forbes 3784 (Bz—23814). MOLUCCA ISLANDS: Amboina: Dolleschal 120 (V). CULTIVATED: China: Chung 2517 (K). Florida: Collector undesignated s.n. (Fl—21145). Hawaiian Islands: A. F. Judd s.n. [Bishop Estate Nursery, Dec. 1, 1930] (Ba).India: Wallich 1745 (K, K, N). MOUNTED ILLUSTRATIONS: Icon. Select. Hort. Thenen. pl. 199 (Br).

VITEX QUINATA var. PUBERULA (H. J. Lam) Moldenke, Phytologia 3: 489. 1951.

Synonymy: Vitex celebica Koord., Meded. Lands Plant-tuin Buitenz. 19: 560 & 645. 1898. Vitex heterophylla var. puberula (Miq.) H. J. Lam, Verbenac. Malay. Arch. 189. 1919. Vitex heterophylla var. puberula H. J. Lam ex Moldenke, Phytologia 3: 489, in syn. 1951.

Literature: Miq., Fl. Ind. Bat. 2: 862—863. 1858; Koord., Meded. Lands Plant-tuin Buitenz. 19: 560 & 645. 1898; H. J. Lam, Verbenac. Malay. Arch. 189. 1919; Bakh. & Lam, Bull. Jard. Bot. Buitenz., ser. 3, 4 (2): 285. 1922; H. J. Lam, Bull. Jard. Bot. Buitenz., ser. 3, 5 (2): 177. 1922; Moldenke in A. C. Sm., Sargentia 1: 115. 1942; Moldenke, Phytologia 3: 489. 1951.

This variety differs from the typical form of the species in having its branchlets softly pubescent, the leaves in general larger, and the leaflets more or less minutely pilose or pubescent on or along the midrib beneath. The petioles are 5—21 cm. long; the leaflets are 3—5 in number, the central one 9—18.5 cm. long and 3.5—9 cm. wide, on petiolules 8—25 mm. long, and the lateral ones 7—14 cm. long and 2.8—7 cm. wide, on petiolules 2—15 mm. long.

It is described as a shrub or else a small or large tree, 3-28 m. tall, the trunk erect, to 150 cm. in diameter at breast height, often to 14 m. tall, with a circumference of 310 cm. at a height of 1 m. from the ground, the crown often 14 m. tall; bark brown, gray, or brownish-gray, fibrous, cracked longitudinally in streaks all along the trunk, yellowish when cut; wood whitish; branches brown-gray; leaves often subglabrous, with just a few minute hairs along the sides of the midrib beneath, deep-green and glossy above, pale-green beneath; flowers fragrant, abundant; flower-buds green and pink-tinged; corollas varying from purple or pale-purple to white-purple or white, sometimes white with a purple tinge in the throat or whitish with the upper lip violet; fruit green or bluish-green when immature, black when mature, bluntly elliptic, about 2 cm. long and 1 cm. wide, fleshy, sweet, edible.

The variety was based by Lam on Korthals s.n. (Le—908267-448) from Sumatra, on Horsfield s.n. (Ut—49904) and Buijsman

250 from Mt. Tengger, Java, and on DeVriese & Teijsmann 28 and 50 from Celebes. It is, however, not a very well-marked variety and some of the specimens cited as typical V. quinata may better be placed here, and vice versa. Lam accredits the varietal name to Miquel, but I cannot find that Miquel ever proposed a varietal epithet for it. In his Flora, cited above, he merely refers to the plant as "Vitex heterophylla Roxb. var. β foliolis quinis subtus in nervis puberis, extimis valde depauperatis" and cites a Horsfield collection from Samarang en Patjitan, Java.

Koorders based his V. celebica on Koorders 19543b, 19544b, 19545b, 19546b, 19548b, 19549b, 19550b, 19551b, 19552b, 19554b, 19556b, 19558b, 19559b, and 19560b, and all of these were originally identified as V. minahassae Koord. by Koorders and Valeton. Koorders states that his V. celebica has the flowers and leaves rather densely glandulose beneath and thus differs from V. minahassae [which latter name actually belongs in the synonymy of V. glabrata R. Br.].

The variety has been found in forests and dense forests, rainforests, coastal thickets, lakesides, in evergreen jungles or at the edges of evergreen jungles on foothills, mixed forests, primary forests on coral islands, edges of forests, in woods along streams, in wooded ravines, and in open places. It is said to be rare in sandy soil on dry cliffs and rare or scattered in sandy soil on moist gentle slopes, at altitudes of 15 to 900 meters. It has been collected in anthesis in February, May, June, and August to December, and in fruit in February, March, June, August, September, and October. Specimens in herbaria have been misidentified as V. glabrata R. Br., V. heterophylla Roxb., V. heterophylla var. undulata C. B. Clarke, V. heterophylla var. genuina H. J. Lam, V. littoralis Decne., V. minahassae Koord., V. negundo L., V. parviflora A. L. Juss., V. pubescens Vahl, V. pubescens var. Miq., and V. urceolata C. B. Clarke. Degener 14481 was erroneously cited by me in Sargentia 1: 115 (1942) as the typical form of the species. Koorders 9846b consists of seedlings with the leaflets coarsely serrate-dentate.

Common names for the variety include "bahoe", "bo", "gofasa", "kalimpapa", "kesileng", "ketileng", "khai nao", "kuruhu", "labansimoet", "mamali", "marambia", "mbo", "mbosawa", "mbothawa", "mote", "nahadori", "ndrai tolu", "papakélan tso", "ridohokko", "sai tsio tau", "sao", "saraúwet", "sarawet", "sember", "semoet", "sohaot", "sowgatmoeroe", "ta phun thao", "tileng", "toelawoto bintalahe", "tomboera matoetoe", "tompira", "tonde", and "yarokasawa".

As an indication of the difficulty botanists have had in identifying material of this plant, consider that the Collector undesignated 5592 collection cited below was identified in sequence as V. littoralis, V. heterophylla, V. pubescens, and V. celebica, and the Herb. Hort. Bot. Bogor. s.n. collection was identified in sequence as V. parviflora, V. pubescens, V. quinata, and V. heterophylla var. undulata.

Citations: CHINA: Kwangsi: Ching 5552 (N). Kwangtung: Herb. Canton Chr. Coll. 12613 (S). Yünnan: A. Henry 1182, in part (N). FORMOSA: A. Henry 1182, in part (N), 1182a (N). HAINAN ISLAND: Lau 153, in part (N), 1908 (N), 1931 (N); Lei 714, in part (Bz--25129); Liang 62780, in part (N); Tsang 178, in part [Herb. Lingnan Univ. 15677] (S), 223, in part [Herb. Lingnan Univ. 15722] (S); C. Wang 33752, in part (S), 34267, in part (S). INDOCHINA: Annam: Clemens & Clemens 3480 (N). Tonkin: Bon 6202 (S); Pételot 963 (N, N), 977 (N), 1081 (N), 6176 (N, N). THAILAND: Bunnak 458 [Herb. Roy. Forest Dept. 12212] (Ss). PHILIPPINE ISLANDS: Leyte: F. Franco s.n. [Herb. Philip. Forest Bur. 26874] (Bz--23823). Luzon: E. D. Merrill 2839 (N). Masbate: W. W. Clark s.n. [Herb. Philip. Forest Bur. 2526] (Bz--24509). CAROLINE ISLANDS: Pelew Islands: Kanehira 2022 (N). SUMATRA: Atjeh 82 [Koorders 10597b] (Bz--25125, Bz--25126), 83 [Koorders 10596b] (Bz--25123, Bz--25124); Barends B.W.6a [Boschproefst. BB.8483] (Bz--25122); Buwalda 701 [Boschproefst. BB.30109] (Bz--25119); Gusdorf 91 (Bz--25111); Lambach 1221 (Bz--25112, Bz--25113, Bz--25706); Teijsmann 3783 (Bz--25120, N); Voogd 17 (Bz--25114); Yates 1609 (Bz--24142, N). JAVA: Backer 1934 (Bz--25059), 2824 (Bz--25062), 12027 (Bz--25060), 16567 (Bz--25069, Bz--25070, Bz--25678), 17102 (Bz--25067, Bz--25068, Bz--25679, Ut--33848a), 18301 (Bz--25058, Ut--33847a), 30465 (Bz--25061, Bz--25682); Bakhuizen van den Brink 1140 (Bz--25077); Beumée 4140 (Bz--25083); Boschwezen 132S [Herb. Bot. Var. 482] (Bz--25064); Burger 2095 (Bz--25075); Buysman 250 (Ut--44160--cotype); Jansen 5715a (Bz--25084); Koorders 9817b [283*] (Bz--24191), 9828b [284*] (Bz--24192), 9831b [1034a] (Bz--24186), 9832b [1185a] (Bz--24187), 9833b (Bz-24185), 9834b (Bz--24189), 9835b [368] (Bz--24153), 9836b [366] (Bz--24154), 9837b [220d] (Bz--24212), 9839b [96d] (Bz--24204), 9840b, in part (Bz--24203), 9841b [1078i] (Bz--24207), 9842b [1108i] (Bz--24208), 9843b [716j] (Bz--24177), 9844b [716j] (Bz-24176), 9845b (Bz--24170), 9846b (Bz--24211), 11687b [1806m] (Bz--24165), 11688b [1806m] (Bz--24164), 11689b [1817] (Bz--24198), 11690b [1634m] (Bz--24193, Bz--25658), 11694b [1817*] (Bz--24197), 11854b [1185a] (Bz--24183), 12846b [721j] (Bz--24178), 12858b (Bz--24217), 13404b (Bz--24161), 13533b [1718m] (Bz--24166), 13534b [1718m] (Bz--24162), 13536b [1718m] (Bz--24195), 13870b (Bz--24188), 14245b [3*] (Bz--24159), 14302b [1817*] (Bz--24160), 14304b [1806m] (Bz--24167), 14308b [1718m] (Bz--24163), 15707b [1185a] (Bz--24184), 20650b (Bz--24218), 22593b [2335*] (Bz--24179), 23468b [1355*] (Bz--24174, Bz--24175), 23640b [1322*] (Bz--24216), 25004b [65c] (Bz--24213), 25328b [365b] (Bz--24201), 26107b [220d] (Bz--24199), 26566b [2448aa] (Bz--24157, Bz--24158), 26721b [290*] (Bz--24190), 27606b [389*] (Bz--24181), 27614b [314*] (Bz--24180), 28171b [220d] (Bz--24200), 28474b [1108i] (Bz--24209), 28477b (Bz--24171, Bz--24172), 29589b (Bz--24196), 30135b [2507aa] (Bz--24156), 30359b [896*] (Bz--24155), 32987b [890*] (Bz--24169), 33903b [219*] (Bz--24205), 34153b [1108i] (Bz--24210), 34268b [1185] (Bz--24182), 35727b [15*] (Bz--24168), 36556b [1630*] (Bz--24206), 36949b [1634m] (Bz--24194), 37591b [21] (Bz--24173), 38449b [4272m] (Bz--24219), 42847b (Bz--24215), s.n. [I.86] (Bz--25066); F. Kramer 5715 (Bz--25078), 5715a (Bz--25079); Leeuwen-Reijnvaan s.n. [Dec. '09] (Bz--25063); Partodimedjo 2 [Boschproefst. Ja.1574] (Bz--25071); Saimoendt 63 (Bz--25076); Soekarman 3 [Boschproefst. Ja.2716] (Bz--24147); Soemadi 6 [Boschproefst. Ja.1781] (Bz--25072); Teijsmann 3783 (Bz--25121); Timmer 6213 [Boschproefst. 2186] (Bz--25081); Ultée 149 (Bz--25080), 1686 (Bz--25082); Veer 34 [Boschproefst. Ja.3286] (Bz--24146); Vincent 5751 [Boschproefst. 3283] (Bz--25085), 5751a [Boschproefst. 3284] (Bz--25086); Wagiman 57 [Boschproefst. Ja. 1859] (Bz--25073, Bz--25074). BRITISH NORTH BORNEO: Castro & Melegrito 1592 (Bz--25049). BORNEO: Atjil & Matali 54 [3355; Boschproefst. BB.10401] (Bz--25047, Bz--25048); Dachlan 46 [3522; Boschproefst. BB.10724] (Bz--25046), 3520 [Boschproefst. BB.10722] (Bz--25050); Moulton 6718 (Bz--25051); Obi 103 [3449; Boschproefst. BB.10585] (Bz--25045). CELEBES: Bish 186 [Boschproefst. BB.18647] (Bz--23835); Boschbouwproefstation BB.13761 (Bz--25097, Bz--25098); Collector undesignated 5592 (Bz--24898); Gobel 18 [Boschproefst. BB.19411] (Bz--23832), 19 [Boschproefst. BB.19412] (Bz--23831); Ham s.n. (Ut--57872); Herb. Bogoriense 23839 (Bz); Kjellberg 532 (Bz--24150, S), 760 (Bz--24151, S), 779 (Bz--24220, Bz--24221, S), 1843 (Bz--24149); Koorders 19543b [55] (Bz--23857, Bz--23858), 19544b (Bz--23846, Bz--23847, Bz--23848, in part, Bz--25649, N--photo, Z--photo), 19545b (Bz--23849), 19546b [2375] (Bz--23853, Bz--23854), 19548b [1391] (Bz--23844, Bz--23845, Bz--25650), 19549b [1514] (Bz--23856), 19550b [2222] (Bz--23861), 19551b [303] (Bz--25105, Bz--25106, Bz--25107, Bz--25651), 19552b [3028] (Bz--23855), 19554b [1143] (Bz--25104, Bz--25652, Bz--25848, in part), 19556b [2258] (Bz--23850), 19558b [1912] (Bz--23859, Bz--23860, Bz--25653), 19559b [2321] (Bz--23851, Bz--23852, Bz--25672), 19560b [1087] (Bz--25109, Bz--25110, Bz--25654); Laleno 20 [Boschproefst. BB.18109] (Bz--23830), 45 [Boschproefst. BB.19440] (Bz--23833), 49 [Boschproefst. BB.19444] (Bz--23834); Maengkom 13 [Boschproefst. BB. 5566] (Bz--23837), 60 [Boschproefst. BB.7551] (Bz--25096); Mumeh 2 [Boschproefst. BB.20284] (Bz--23829); Palit 16 [Boschprofst. BB.29476] (Bz--25431); Politon 16 [Boschproefst. BB.

31495] (Bz—25094), 44 [Boschproefst. BB.31869] (Bz—25093); Teijsmann 11994 (Bz—25100, Bz—25101); Walangitang 6 [Boschproefst. BB.5159] (Bz—23836), 21 [Boschproefst. BB.13742] (Bz—25102), 78 [Boschproefst. Cel./I.78] (Bz—25103); Waturandang 246 [Boschproefst. BB.21775] (Bz—23862), 281 [Boschproefst. Cel./V.249] (Bz—23828, Bz—25648), 617 [Boschproefst. Cel./V.383] (Bz—23825), 618 [Boschproefst. Cel./V.384] (Bz—23826), 619 [Boschproefst. Cel./V.385] (Bz—23824); Wullur 23 [Boschproefst. BB.13761] (Bz—25095); Yamel 7 [Boschproefst. BB.31837] (Bz—25099). MOENA ISLAND: Collector undesignated 3783 H.B. (Ut-44162). MOLUCCA ISLANDS: Batjan: Herb. Hort. Bot. Bogor. XII (Bz—25087). Buru: Oersipuny 80 [Boschproefst. BB.21489] (Bz—25433). Halmaheira: Beguin 2019 (Bz—23816, Bz—25647); H. J. Lam 3636, in part (N). Morotai: Kostermans & Tangkilison 120 [Boschproefst. BB.33813] (Bz—72600, Bz—72601); H. J. Lam 3636, in part (Bz—23815); Tangkilison 200 [Boschproefst. BB.33873] (Bz—72879). Obi: Haan 317 [Boschproefst. BB.23819] (Bz—25430). Soelabesi: Atje 406 [Hulstijn 406] (Bz—23817, Bz—23818, N). NEW GUINEA: Dutch New Guinea: Aet 238 (Bz—72970); Kostermans 101 [Boschproefst. BB.33334] (Bz—72794, Bz—72795), 153 [Boschproefst. BB.33376] (Bz—72826, Bz—72827), 235 [Boschproefst. BB.33439] (Bz—72830, Bz—72831), 237 [Boschproefst. BB.33441] (Bz—72833), 274 [Boschproefst. BB.33470] (Bz—72828, Bz—72829); Lundquist 39 [Boschproefst. BB.32658] (Bz—25089), 109 [Boschproefst. BB.32828] (Bz—72969), 148 [Boschproefst. BB.32867] (Bz—72937); Salverda 528 [Boschproefst. BB.22515] (Bz—23819, N); Soehanda & Ilham 16 [Boschproefst. BB.33264] (Bz—72793), 30 [Boschproefst. BB.33278] (Bz—72832). AROE ISLANDS: Oedjir: Buwalda 452 [Boschproefst. BB.25486] (Bz—25090). FIJI ISLANDS: Viti Levu: Degener 14481 (A, N, N); J. W. Gillespie 2953 (N), 4164 (Bz—24321, N), 4164.1 (Du—235263); Greenwood 344a (N); A. C. Smith 4307 (N), 6295 (N), 8881 (Z), 9119 (Hk). CULTIVATED: Java: Herb. Hort. Bot. Bogor. XI.I.35 (Bz—25839, Bz), XI.J.1 (Bz—25846, N), XI.J.35 (Bz—25838, Bz—26589, Bz, Bz, Bz, N), XI.K.10 (Bz—25858, Bz—25859, Bz—26588), XI.K.20 (Bz—25868, N), XIII.J.84 (Bz—25252, Bz, Bz), s.n. [from Sumatra] (Bz—25052, Bz—25053, Bz—25054, Bz—25055, Bz—25056, Bz—25115, Bz—25116, Bz—25117, Bz—25118). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated 441 (Ut—39904), s.n. [Delor Rurnon, May '79] (Pr); Herb. Bogoriense 25711 (Bz); Herb. A. Gray s.n. (T).

VITEX QUINATA var. WITTROCKIANA Moldenke, Geogr. Distrib. Avicenn. 40, nom. nud. (1939); Phytologia 1: 440. 1940.

Literature: Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Moldenke, Phytologia 1: 440. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 89. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 166 & 202. 1949.

This variety differs from the typical form of the species in its smaller inflorescences, which are only 10—12 cm. long and are less thyrsoid, often not branched, with few-flowered and very loose cymes, which are long-stipitate and divaricate-furcate with long and very slender branches, and elongate filiform pedicels 3-5 mm. long, the branchlets, twigs, peduncles, rachis, cyme-branches, pedicels, petioles, and calyx glabrous throughout, and the flowers larger.

The type of the variety was collected by Benedict Balansa (*no. 3815*) in cultivation in Tonkin, Indochina, in May of 1887, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. Thus far it is known only from cultivated material. It is named in honor of my recently departed friend and colleague, Gustave Ludwig Wittrock (1895—1954), expert on plants used for food or other purposes by the Amerinds, on economic plants in general, and on the genus *Agoseris*, and for many years in charge of the Asiatic Herbarium at the New York Botanical Garden.

Citations: CULTIVATED: Hongkong: *Herb. Hongkong Bot. Gard. 6* (K, N). Indochina: *Balansa 3815* (K—type).

VITEX RADULA Mildbr. ex Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 42, 55, & 84. 1928; Fedde, Repert. 26: 161. 1929.

Literature: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 42, 55, & 84. 1928; Pieper in Fedde, Repert. 26: 161. 1929; Hill, Ind. Kew. Suppl. 8: 249. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50, 51, & 104 (1942) and [ed. 2], 117, 120, & 202. 1949.

Shrub or small tree; branchlets shortly 4-alate, short-hirtous; leaves 3—5-foliolate; petioles 5—8 cm. long, shortly fuscous-hirtous; leaflet-blades very rough above, hirsute beneath, the central one elliptic, acuminate at the apex, on a petiolule 1.5 cm. long, the lateral ones obliquely elliptic, acuminate, on shorter petiolules; inflorescence terminal, paniculate, fuscous-velutinous; bractlets minute; fruiting-calyx patelliform, fuscous-hirtous and sparsely glandulose on the outside, the rim obtusely 5-lobed, the lobes apiculate; fruit glabrous, about 6 mm. wide, drupaceous, orange-colored, densely glandulose, the mesocarp very thin.

The type of this species was collected by Adolf Ferdinand Stolz (*no. 1398*) at Kyimbila, Nyasaland, and is deposited in the herbarium of the Botanisches Museum at Berlin. Pieper cites also *Busse 2984* from Lindi, Tanganyika Territory. Thus far it is known only from these two collections.

Citations: BRITISH NYASALAND PROTECTORATE: *Stolz 1398* (N—cotype, N—photo of cotype, S—cotype, Z—photo of cotype).

VITEX RAPINI Beauvis., Gen. Montrouz. 66—68. 1901.

Synonymy: *Rapinia triphylla* Montr. ex Beauvis., Gen. Montrouz. 66. 1901. *Rapinia collina* vars. *a* & *b* Montr. ex Beauvis., Gen. Montrouz. 66. 1901.

Literature: Beauvis., Gen. Montrouz. 66--68. 1901; Moldenke, Known Geogr. Distrib. Verbenac., [ed, 1], 68 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 78. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 151 & 202. 1949.

Shrub 2--5 m. tall; leaves opposite, 3--5-foliolate; stipule-scars more or less conspicuous; petioles 2--6 cm. long, narrowly canaliculate above; petiolules broadly canaliculate above; leaflets mostly very unequal, the blades varying from elliptic to ovate or suborbicular, obtuse at the apex, varying from truncate to almost heart-shaped or slightly attenuate at the base, often asymmetric, the central one largest, 4.5--7.5 cm. long, 3.5--6.3 cm. wide; inflorescence cymose, axillary, 3--5-flowered; peduncles 10--15 [rarely 20] mm. long; pedicels 6--9 [rarely 12] mm. long; flowers similar to those of *Neorapinia collina* (Montr.) Moldenke.

The species is based on *Montrouzier 185* and *186* in the Leiden herbarium and *280* in the Montpellier herbarium, collected on hills and mountains on Art Island, New Caledonia. Beauvisage cites also *Balansa 474* and *1834*. He says that *Vieillard 993*, *994*, and *3064* and *Balansa 1835* may also belong here, but have smaller leaves and many-flowered cymes. The species has been collected at an altitude of 300 meters and is apparently endemic to New Caledonia.

The "stipule-scars" mentioned in the description of this plant may actually refer to annulations at the nodes very often seen in this genus and other genera of *Verbenaceae*, whose leaves are exstipulate.

Citations: NEW CALEDONIA: *Deplanche 486* (Br, C, E--photo, N--photo, V, Z--photo); *Schlechter 15249* [Herb. Hort. Then. I:5999] (Br).

VITEX RAPINIOIDES Guillaum., Journ. Arn. Arb. 13: 27. 1932.

Synonymy: *Vitex rapinoides* Guillaum. ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 68 & 104, sphalm. 1942.

Literature: Guillaum., Journ. Arn. Arb. 13: 27. 1932; Hill, Ind. Kew. Suppl. 9: 297. 1938; Moldenke, Suppl. List Common Names 9 & 15. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 68 & 104. 1942; Moldenke, Phytologia 2: 122. 1944; Moldenke, Alph. List Invalid Names Suppl. 1: 29. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 150 & 202. 1949.

Large tree, to 20 m. tall; trunk 60 cm. in diameter; wood yellow, very hard but also very faulty; branches yellow, puberulent when young; leaves 3--5-foliolate; petioles 2.5--5 cm. long, reddish-puberulent when young, glabrescent in age; leaflet-blades membranous, rigid, ovate or ovate-lanceolate to lanceolate, 3--9 cm. long, 1.5--5 cm. wide, acuminate at the apex, obtuse or cuneate at the base, red-puberulent when young, later glabrescent and glandular-punctate beneath; petiolules red-puberulent when young, later glabrescent; inflorescence cymose, to 4 cm. long, 3-flowered; peduncles slender, 1—1.5 cm. long, sparsely red-puberulent, bearing 2 bractlets at the apex; bractlets filiform, 2—3 mm. long, red-puberulent; pedicels 1.5-2 cm. long, the lateral ones with 2 opposite prophylla which are 1 mm. long and red-glandulose-puberulent; calyx campanulate, about 4 mm. long, densely red-glandulose outside, the margin truncate, lanuginous with red hairs in 4-penicellate fashion; corolla pink or red, about 2 cm. long, densely red-puberulent except at the base, the tube about 1.5 cm. long, lanuginous within above the insertion of the stamens, the lobes rounded, the larger one about 6 mm. long, lanuginous within; stamens exserted; filaments inserted about 3 mm. above the base of the corolla-tube, lanuginous; style elongate; stigma bifid; ovary globose, glabrous, 4-celled; fruiting-calyx patelliform, about 6 mm. wide; fruit red or pink, depressed-globose, about 1.3 cm. long and 1.5 cm. wide, 4-celled, the mesocarp about 5 mm. thick.

The type of this species was collected by J. P. Wilson (*Kajewski 992*) in September of 1929 on the seashore at an altitude of about 50 feet, at Aname, on the west coast of Aneityum Island, New Hebrides, where it is described as being "common", with "bell-shaped flowers". It has been collected in anthesis in April, May, and September, and in fruit in April and May. The wood is used locally in the construction of native homes. The tree is common on the islands and is called "incdic"and "nay-mof-si" or "nay-mofsi". It ascends to 300 meters altitude in the rainforests. The flowers are said to be pink and bell-shaped. The fruit is pink or red, about half an inch long and 5/8 inch in diameter.

Guillaumin cites also *J. P. Wilson 211* from Efate and *299* from Eromangá. The latter is undoubtedly the *Kajewski 299* cited below. The species is most closely related to *V. rapini* Beauvis. which, however, has much thinner leaflet-blades of different shape. The Efate collection is remarkable because of its more elongated oval-lanceolate or lanceolate leaflet-blades.

Citations: NEW HEBRIDES: Aneityum: *J. P. Wilson s.n.* [Kajewski 992] (La—isotype). Efate: *Kajewski 211* (La). Eromanga: *Kajewski 299* (La).

VITEX REGNELLIANA Moldenke, Geogr. Distrib. Avicenn. 27, nom. nud. 1939; Phytologia 2: 30—31. 1941.

Literature: Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Phytologia 2: 30—31. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 78. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949.

Shrub or tree; branchlets slender, medullose, obtusely tetragonal, grayish, compressed and rather ampliate at the nodes, puberulent or short-pubescent when young, becoming glabrate in age; twigs slender, tetragonal, compressed, very densely velutinous with ferruginous villous-tomentose pubescence, ampliate-compressed at the nodes; nodes annulate; principal internodes

1--6 cm. long; leaf-scars very large and corky, greatly elevated; buds densely ferruginous-villous or -velutinous; leaves decussate-opposite, 3-foliolate; petioles slender, 4--10.5 cm. long, slightly ampliate at the base, flattened above, very densely velutinous-villous or tomentose with ferruginous hairs; leaflets subequal, sessile or subsessile; leaflet-blades thin-chartaceous, uniformly dark- or bright-green on both surfaces under the ferruginous tomentum, the central one oblong, narrow-elliptic, or oblanceolate, 5.5--10 cm. long, 1.5--3.2 cm. wide, acute or very abruptly short-acuminate at the apex, entire, acute or obtuse at the base, very densely velutinous-villous on both surfaces or somewhat more tomentose beneath, the pubescence golden or ferruginous, the lateral leaflets similar in all respects only often somewhat inequilateral and usually more obtuse at the base; midrib slender, flat or subprominulent above, prominent beneath; secondaries slender, about 10 per side, mostly hidden by the long pubescence on both surfaces or prominulous beneath; vein and veinlet reticulation not discernible above, mostly obscure beneath or sometimes the largest parts slightly subprominulous beneath; inflorescence axillary, cymose, 3--8 cm. long, 2--4.5 cm. wide, 1--3 times dichotomous, dense, the branches much abbreviated, densely ferruginous-velutinous or villous-tomentose throughout, conspicuously bracteate; peduncles slender, 1.5--5.2 cm. long, flattened, densely ferruginous-velutinous or villous-tomentose like the twigs and petioles; pedicels very slender, 1--2 mm. long, or obsolete on lateral flowers; bracts numerous, simple, oblong or lanceolate, 1--1.8 cm. long, densely velutinous like the leaflets, sessile, acute; bractlets linear, 3--6 mm. long, densely ferruginous-pubescent; prophylla linear, about 1 mm. long, hidden by the tomentum; calyx campanulate, densely ferruginous-velutinous with more or less antrorse hairs on the outside, the tube 5--6 mm. long, 4--7 mm. wide, its rim caudate-lobed, the lobes lanceolate, about 5 mm. long and 1.5 mm. wide, attenuate-acute; corolla hypocrateriform, violet or white, its tube broadly cylindric, about 1.5 cm. long and 3.5 mm. wide, not ampliate at the apex, densely ferruginous-tomentose on the outside, its limb conspicuously 2-lipped, the 4 small lobes oblong-ovate, about 6 mm. long and 2 mm. wide, blunt at the apex, the central lower lobe greatly enlarged, about 10 mm. long and 6 mm. wide, rounded, puberulent on both surfaces, bearded at the base within; stamens and style exserted less than 1 cm. from the corolla-throat; fruiting-calyx and fruit not known.

The type of this handsome species was collected by Don Bento José Pickel (no. 3211) in a thicket at Tapera, Pernambuco, Brazil, on January 26, 1933, and is deposited in the herbarium of the Catholic University of America at Washington. It is names in honor of Anders Fredrik Regnell, famous explorer and botanist, to whom we owe so much of our knowledge of the Brazilian flora. It has been collected in anthesis from November to January, and has in the past been confused with V. polygama Cham., to which it is obviously closely related. Mature leaves, as well as longhand notes, are found on the Ridley, Lea, and Ramage specimens at the British Museum.

Citations: BRAZIL: Pernambuco: Pickel 3211 (Ba--isotype, Ca--520586--isotype, E--photo of type, F--702499--isotype, G--isotype, I--type, I--isotype, Mi--isotype, N--isotype, N--photo of type, N--photo of isotype, S--isotype, Z--photo of type, Z--photo of isotype); Ridley, Lea, & Ramage s.n. [24 Nov.] (Bm), s. n. [12 Dec.] (Bm). São Paulo: Santoro s.n. [Fazenda Santa Elisa, November 25, 1936; Herb. Inst. Agron. Est. S. Paulo 855] (N).

VITEX REHMANNI Gürke, Bull. Herb. Boiss. 4: 818. 1896.

Synonymy: Vitex rehmannii Gürke ex Moldenke, Alph. List Invalid Names 55, in syn. 1942.

Literature: Gürke, Bull. Herb. Boiss. 4: 818. 1896; H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 214--215. 1901; Galpin, Bot. Surv. S. Afr. Mem. 7: 23--25, fig. 50. 1925; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 52, 74, & 84. 1928; Moldenke, Alph. List Common Names 30. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104. 1942; Moldenke, Alph. List Invalid Names 55. 1942; Moldenke, Phytologia 2: 122. 1944; H. N. & A. L. Moldenke, Plant Life 2: 78. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 122 & 202. 1949.

Illustrations: Galpin, Bot. Surv. S. Afr. Mem. 7: fig. 50. 1925.

A shrub or small tree, to 10 m. tall; bark black, rough; trunk 22--30 cm. in diameter; wood yellowish-gray, of medium hardness and weight, with straight somewhat short grain of fair strength, works easily, takes a good finish, not attacked by termites after being properly seasoned; branches with short internodes and prominent leaf-scars, finely tomentose on the younger parts; leaves decussate-opposite, petiolate, 3--5-foliolate, green in March; petioles subangular, 1--4 cm. long, finely pubescent; leaflet-blades subcoriaceous, oblong-elliptic or elliptic-lanceolate, varying from acuminate or acute to subacute or obtuse at the apex, entire and sinuate along the margins, cuneate at the base, subsessile or on finely pubescent petiolules 2--7 mm. long, profusely glandulose, glabrous above, finely pubescent on the venation beneath, otherwise puberulous or glabrous beneath, the central one 2--7 cm. long, 0.5--2.2 cm. wide, the lateral ones often much smaller; secondaries 8--16 per side, obscure above, distinct beneath; inflorescence cymose, pedunculate, axillary, divaricate, bracteate, equaling or slightly surpassing the subtending leaves, finely tomentose; bracts linear-spatulate, pubescent and glandulose, the lower ones 5--10 mm. long; flowers short-pedicellate, bracteolate, about 1 cm. long; calyx campanulate, its tube 2--4 mm. long, 10-nerved, prominently 10-ribbed, glabrous within, finely pubescent and profusely glandulose outside, its rim spreading, shortly 5-lobed, the lobes ovate-triangular, 1--1.5 mm. long, 1--1.5 mm. wide at the base, acute or short-apiculate at the apex, keeled, finely pubescent and glandular; corolla pale bright-mauve or white and tinged inside on the lower lip, its tube straight, about 6 mm. long, profusely glandulose and pubescent outside on the upper three-quarters of its length, puberulent in the anterior portion but otherwise glabrous within, its lobes pubescent and glandulose; stamens inserted below the middle of the corolla-tube, included; anthers dark-purple; filaments villous at the base; ovary densely pubescent and glandulose on the upper half; fruit drupaceous, obconic, 5--6 mm. long, 3--4 mm. wide, shorter than the subtending accrescent fruiting-calyx, profusely glandulose.

The species is based on Rehmann 5422 from Strydpoort in the Makapans Mountains, Transvaal, Union of South Africa. The Meeuse 9491 collection is a topotype collection. Pearson and Pieper both also cite Nelson 101 from Nylstrom, Transvaal, and Gerrard 1510 and Sutherland s.n. from Natal. Pieper places the species in the subgenus Holmskioldiopsis Pieper.

The species inhabits white sandy flats in sour bushveld, mixed bushveld on rocky slopes, and "thorns" areas. Galpin states that "it is abundant and increasing in the sandveld to which it is strictly confined" in the Springbok flats area of the Cape of Good Hope. It has been collected at altitudes of from 2000 to 6000 feet, flowering in December and fruiting in April. It suffers from frost and puts out adventitious shoots. Common names are "manohani", "mokoele", "pijpsteel", and "thorns". Galpin states that "owing to the many stronger timbers available, it is little used locally, but should be useful for general purposes. Used by natives for stools. The young twigs have hollow stems and are used as stems for tobacco pipes, hence the local name 'pijpsteel'" or "pypsteel" and also "good for hammer handles, etc."

Citations: UNION OF SOUTH AFRICA: Cape of Good Hope: Galpin 282M (Af, N--photo, S--photo, Z--photo). Natal: Dimock Brown 60 [J. M. Wood 4463] (Na--6115, Na--7541); Gerstner 614 (Cb); Haygarth s.n. [J. M. Wood 10777] (Vt); Kuntze s.n. [17/3/94] (N); J. M. Wood 6794 (N, N--photo, Na--8556, Z--photo). Transvaal: Codd 969 (Af, Ss); Dyer & Verdoorn 4254 (Z); Leemann 20 (S); Leendertz 2314 (N); Meeuse 9491 (Ss), s.n. (Cb); Mogg s.n. [11-12-1934] (Ss); Pole-Evans 3102 [21] (S); Son s.n. [Herb. Transvaal Mus. 30440] (N, Rh); Thode A.451 (Na--23494), A.1760 (Na--25140).

VITEX REHMANNI f. SUBTOMENTOSA Moldenke, Phytologia 5: 20. 1954.

Synonymy: Vitex rehmannii f. subtomentosa Moldenke, Trav. Lab. Bot. Syst. Brux. 16: 66, sphalm. 1955.

Literature: Moldenke, Phytologia 5: 20. 1954; Trav. Lab. Bot. Syst. Brux. 16: 66. 1955.

This form differs from the typical form of the species in having the lower leaflet-surface densely white-subtomentose.

The type of the form was collected by J. E. Repton (no. 2781) on the upper south slope of the Wonderboom Reserve, Pretoria, Transvaal, Union of South Africa, on January 4, 1946, and is deposited in the National Herbarium at Pretoria. It has been collected at an altitude of 3000 feet, and the corollas are described as pale-blue, the tree 8—9 feet tall.

Citations: UNION OF SOUTH AFRICA: Transvaal: Repton 2781 (Z—isotype); Story 1520 (Cb).

VITEX RESINIFERA Moldenke, Phytologia 3: 446—447. 1951.

Shrub, 1—2 m. tall; branches and branchlets slender, grayish-brown, obtusely tetragonal, densely puberulent on the younger parts, glabrescent in age, lenticellate; nodes not annulate; principal internodes 0.6—3 cm. long, mostly abbreviated; leaf-scars minute; leaves decussate-opposite, 1-foliolate; petioles very slender, 6—14 mm. long, flattened above, minutely appressed-puberulous, brunnescent in drying; blades chartaceous, brunnescent in drying, dark and shiny above, lighter beneath, narrowly elliptic, 2.5—6.5 cm. long, 8—22 mm. wide, acute or short-acuminate at the apex, entire, mostly obtuse or rounded (rarely acute) at the base, densely resinous-punctulate on both surfaces, more or less obscurely and very minutely puberulent beneath; midrib slender, impressed above, prominent beneath; secondaries filiform, about 6 per side, arcuate-ascending, flat or very slightly subprominulous above, prominulous beneath; veinlet reticulation very abundant and fine, often subprominulous above, flat beneath or the larger portions subprominulous; inflorescence axillary, usually shorter or subequaling the subtending leaves, 1—3-flowered, conspicuously bracteolate; peduncles slender, 1.3—3 cm. long, appressed-puberulous, flattened, terminated by a pair of conspicuous bractlets which are narrowly oblong, about 5 mm. long and 1 mm. wide, minutely puberulous; pedicels filiform, 5—7 mm. long under the central floret, 1—3 mm. long under the lateral ones which are borne on filiform cyme-branches about 10 mm. long, minutely appressed-puberulous; calyx membranous, campanulate, deeply lobed to near the base, minutely appressed-puberulous, the tube about 2 mm. long and wide, the 5 equal lobes oblong-lanceolate, 4—5 mm. long and 1-1.5 mm. wide, acute at the apex; corolla-tube green, broadly cylindric, about 6 mm. long, ampliate at the apex, not arched, minutely appressed-puberulent on the outside, the limb labiate, the upper lip hooded, 2-lobed, green, the lower lip 3-lobed, white, the central lobe rounded; fruiting-calyx unchanged except that the united portion is much broader; fruit drupaceous, globose, nigrescent in drying, about 4 mm. long and wide.

The type of this endemic species was collected by Joseph Marie Henri Alfred Perrier de la Bâthie (no. 1727) on granitic soil in woods on Mount Ambokibenga, Milanja, Madagascar, in May of 1904, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. It is known only from the original collection.

Citations: MADAGASCAR: Perrier de la Bâthie 1727 (N—isotype, N—photo of type, P—type, Z—photo of type).

VITEX RIVULARIS Gürke in Engl., Bot. Jahrb. 33: 297—298. 1904.

Synonymy: Vitex cilio foliolata A. Chev., Expl. Bot. Afr.

Occid. Franç. 1: 506, hyponym. 1920. Vitex cilio-foliolata A. Chev. ex Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]:80. 1928. Vitex ciliofoliolata A. Chev. ex Moldenke, Alph. List Invalid Names 52, in syn. 1942.

Literature: Gürke in Engl., Bot. Jahrb. 33: 297—298. 1904; A. Chev., Expl. Bot. Afr. Occid. Franç. 1: 506. 1920; Hill, Ind. Kew. Suppl. 6: 219. 1926; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 43, 56, 80, & 84. 1928; DeWild., Plant. Bequaert. 5: 18. 1929; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 47, 48, & 104. 1942; Moldenke, Alph. List Invalid Names 52. 1942; Moldenke, Phytologia 2: 122. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 112—114 & 202. 1949.

Tree, the trunk to 8 m. tall, with strongly developed pith; branches drooping; leaves 5—7-foliolate; petioles 10—15 cm. long, flat above, glabrous; leaflet-blades thin-membranous, broadly lanceolate, very long-acuminate at the apex, entire, attenuate at the base into the petiolules, glabrous or subglabrous above with a few scattered hairs, more densely pilosulous along the secondaries, pubescent and yellowish-glandulose beneath, the central one (exclusive of the acumination) about 10 cm. long and 4 cm. wide or 2 1/2 times as long as wide, the lateral ones smaller, the basal ones about 5 cm. long and 2 cm. wide; petiolules 7—15 mm. long, sparsely pilose except at the densely tomentose base; inflorescence axillary, cymose, very lax, in the upper leaf-axils, the branches scattered-pilose, more densely so at the base of each furcation; peduncles very long, 9—12 cm. long; bractlets filiform and 3—5 mm. long in the upper branches of the inflorescence, probably longer on the lower branches but there caducous; calyx cupuliform at time of anthesis, yellow-glandulose on the outer surface, the rim 5-dentate; fruiting-calyx greatly accrescent, globose, with distinct but flattened teeth.

The type of this species was collected in April, 1897, in bud stage, by Georg August Zenker (no. 1333) on the banks of the Lokundje, Bipinde, Cameroons. The type of V. ciliofoliolata was collected by Auguste J. B. Chevalier (no. 19097) at Guidéko, in the basin of the Upper Sassandra, Ivory Coast, on June 16, 1907. The species is found in primeval and riverbank forests, and common names are "akwakora-gyahini", "antelope's garden egg", "kataboawin", "old man's shin-bone", "ŏtwentŏrowa", and "ububan". Pieper cites in addition Zenker 4099c and places the species in Sect. Chrysomallum, where it is distinguished by its very lax inflorescences and very long-acuminate leaflets. It is closely related to V. vermoeseni De Wild., which see for copious notes on the differences between the two.

Citations: SOUTHERN NIGERIA: J. D. Kennedy 910 (S). CAMEROONS: Zenker 1333 (N—isotype, N—photo of isotype, S—isotype, Z—photo of isotype), 2691a (S), 2909 (S), 3764 (S), 4205 (Af, Br, N, S), 4219 (Af, Af, Br, Br, S), 4503 (Af, Br, N—photo, S, Z—photo), 4795 (Br, Br, S). BELGIAN CONGO: Bredo 4248 (Br);

Vanderyst 3105 (Br); Vermoesen 2142 (Br, Br).

VITEX ROBYNSI DeWild., Pl. Bequaert. 5: 13—14. 1929.

Literature: DeWild., Pl. Bequaert. 5: 13—14. 1929; Hill, Ind. Kew. Suppl. 8: 249. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 79. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 202. 1949.

Shrub, to 3 m. tall; branches slender, ascending, tetragonal, more or less alate, more or less velutinous toward the tip; leaves 5-foliolate; petioles 6—10 cm. long, more or less clearly canaliculate above, subalate on the angles; petiolules 2—10 mm. long, or subobsolete on lateral leaflets; leaflet-blades obovate or elliptic-lanceolate, 5—10 cm. long, 2—4 cm. wide, more or less acuminate at the apex, entire, the lateral ones more or less cuneiformly narrowed at the base and subinequilateral, the central one cuneiform and equilateral at the base, all velutinous-scabrous above, densely short-tomentose beneath, non-glandulose; secondaries 6—8 per side; inflorescence axillary and terminal, more or less branched, loose, many-flowered, forming a terminal panicle, the floriferous portion 8—12 cm. long, the inflorescence-branches simple or dichotomous, to 1.5 cm. long; peduncles naked, 8—16 mm. long, short-pubescent; bractlets filiform, velutinous, caducous; flowers not known; fruiting pedicels to 15 mm. long; fruiting-calyx accrescent, subglabrous outside, its rim truncate, obscurely 5-dentate; fruit yellowish, subglobose, 6—7 mm. long and wide, the epidermis exfoliating.

The type of this beautiful species was collected by Frans Hubert Edouard Arthur Walter Robyns (no. 1913) — in whose honor it is named — in a shrubby savanna at Kasenga, at an altitude of about 970 meters, Belgian Congo, on April 8, 1926, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. DeWildeman notes that because of the absence of flowers the species can be classified only with certainty in Sect. Terminales as defined by Pieper. Not being able to see the upper lip of the corolla, it cannot be stated with certainty that it belongs in the group Quinquelobatae, but it seems to belong there because of its apparent close affinity with V. volkensii Gürke and V. buchananii J. G. Baker (misspelled "Buchanani" by DeWildeman). It seems to come closest to the latter species because of its long petioles and leaflet-blades. It differs from V. volkensii by the absence of the many circular glands which are subimmersed in the leaflet-blades of that species. In the classification of Baker, the species would come close to V. thyrsiflora J. G. Baker, from which it differs in having the leaflet-blades clearly velutinous-tomentose beneath.

Citations: NORTHERN RHODESIA: Bredo 4008 (Br, N). BELGIAN CONGO: Robyns 1913 (Br—type, Br—isotype, N--photo of type, Z-photo of type).

VITEX RUBRA Moldenke, Phytologia 3: 447. 1951.

Shrub or small tree; branches and branchlets medium-slender, gray, often lichen-encrusted, obtusely tetragonal, appressed-puberulent, glabrescent in age; nodes not annulate; principal internodes much abbreviated and about 5 mm. long, elongated to 4 cm. on larger branchlets; leaves decussate-opposite, 1-foliolate; petioles rather stoutish, 2--15 mm. long, flat and canaliculate above, minutely puberulous; blades coriaceous, gray-green on both surfaces and rather shiny, elliptic, 2.5--6.5 cm. long, 1.2--4.2 cm. wide, rounded or emarginate at the apex, entire and plainly revolute along the margins, acute or short-acuminate at the base, glabrous and densely impressed-punctate on both surfaces; midrib slender, flat above, prominent beneath; secondaries very slender, 5 or 6 per side, arcuate-ascending, flat and rather obscure above, prominulous beneath; veinlet reticulation indiscernible on both surfaces; inflorescence axillary, 1- to few-flowered, shorter than the subtending leaves; peduncles very slender or subfiliform, obsolete or to 5 mm. long, puberulent; pedicels filiform, about 2 mm. long, whitish-puberulent; bractlets linear-oblong, about 2 mm. long and 1 mm. wide, conduplicate, whitish-puberulent; calyx campanulate, 2--3 mm. long, 1.5--2 mm. wide, grayish-puberulent, its rim plainly 5-toothed, the teeth ovate, about 1 mm. long; corolla dark-red, its tube cylindric, arched, 1.5--1.8 cm. long, densely pubescent on the outside, the lobes about 2 mm. long, erect; stamens and pistil exserted 8--9 mm. from the corolla-tube; fruiting-calyx somewhat incrassate, campanulate, about 5 mm. long and 7 mm. wide, puberulent, the rim deeply 5-toothed, the teeth ovate, 2--2.5 mm. long, acute at the apex; fruit drupaceous, elliptic, about 7 mm. long and 5 mm. wide, glabrous, wrinkled in drying.

The type of this species was collected by Joseph Marie Henri Alfred Perrier de la Bâthie (no. 13709) at an altitude of 1500 meters on the Massif d'Andringitra, Madagascar, on April 19, 1911, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

Citations: MADAGASCAR: Humbert 6382 (P); Perrier de la Bâthie 12679 (N, P), 13709 (N--photo of type, P--type, Z--photo of type).

VITEX RUBRO-AURANTIACA DeWild., Pl. Bequaert. 5: 15--16. 1929.

Literature: DeWild., Pl. Bequaert. 5: 15--16. 1929; Hill, Ind. Kew. Suppl. 8: 249. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 104 (1942) and [ed. 2], 115 & 202. 1949.

Shrub; branches cylindric when old, obscurely tetragonal on the youngest parts toward the tips, glabrescent; leaves 5-foliolate, all the leaflets equilateral or subequilateral; petioles 5--13 cm. long, glabrous, clearly canaliculate above; petiolules 2--15 mm. long, glabrous or with a few scattered hairs; leaflet-blades lanceolate-elliptic, 3.8--24 cm. long, 1.5--6.5 cm. wide, more or less abruptly long-acuminate at the apex, entire, long-cuneiform to the base, glabrous above, glabrous beneath or sparsely appressed-pilosulous on the larger veins, the acumination apiculate and to 2 cm. long; secondaries about 10 per side; inflorescence axillary, somewhat branched, about 3 cm. long; peduncles 8—11 mm. long; cymes lax, glabrous, many-flowered, bracteolate, the branches about 5 mm. long; bractlets filiform, velutinous, to 2 mm. long, caducous; pedicels 3—4 mm. long, sparsely appressed-velutinous; calyx campanulate, about 3 mm. long, narrowed to the base, sparsely appressed-villous outside, its rim shortly 5-dentate, the teeth less than 1 mm. long; corolla red-orange or yellow-orange, short-tubular, its tube curvate, 8—10 mm. long, velutinous outside on the part not covered by the calyx, glabrous within except for a velutinous portion at the insertion of the stamens, the anterior lobe about 3 mm. long and 3.5 mm. wide, less velutinous than the tube, the lateral lobes shorter; ovary ovoid-globose, glabrous except for a few erect hairs toward the apex; fruit not known.

The type of this species was collected by Joseph Carles Corneille Bequaert (no. 6469) in the virgin forest between Masisi and Walikale, Belgian Congo, on January 3, 1915, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. De Wildeman states that this species belongs in the Sect. Axillares of the Subgenus Euvitex as defined by Pieper, in the Subsect. Cymosae and the Grex Glandulosae. Because of the dimensions of the upper lip of the corolla, it seems to belong in the group with V. rivularis Gürke. It also closely approaches V. impressinervia Mildbr. because of its relatively large flowers, the characters of the calyx and corolla, its scattered appressed hairs, the calyx contracted at the base, and the short peduncles.

Citations: BELGIAN CONGO: Louis 2262 (N, N—photo, S, Z—photo), 6174 (N).

VITEX RUFA A. Chev., Expl. Bot. Afr. Occid. Franç. 1: 507, hyponym. 1920; Cavaco, Bull. Mus. Nat. Hist. Paris, sér. 2, 27: 91. 1956.

Literature: A. Chev., Expl. Bot. Afr. Occid. Franç. 1: 507. 1920; Hill, Ind. Kew. Suppl. 6: 219. 1926; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 80. 1928; Cooper & Record, Bull. Yale Univ. School Forestry 31: pl. 11. 1931; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 46 & 104. 1942; Moldenke, Phytologia 2: 122. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 112 & 202. 1949; Cavaco, Bull. Mus. Nat. Hist. Paris, sér. 2, 27: 91. 1956.

Illustrations: Cooper & Record, Bull. Yale Univ. School Forestry 31: pl. 11. 1931.

Nothing is known of this species except that it is supposed to grow in the Ivory Coast, where the type was collected by Auguste J. B. Chevalier (no. 19712) at the village of Grabo, in the country of the Tépos, in the basin of the Cavally, on August 3, 1907. No formal description has ever been published, as far as I am aware, but Chevalier says that it is a shrub. A common name recorded for it is "kpar-seh". The G. P. Cooper 355, at one time regarded as representing this species by me, proves to be V. congolensis DeWild. & Th. Dur.

VITEX RUFESCENS A. L. Juss., Ann. Mus. Paris 7: 77. 1806.

Synonymy: Vitex perriana Moldenke, Geogr. Distrib. Avicenn. 27, nom. nud. 1939; Trop. Woods 64: 38--39. 1940. Vitex tomentosa Rich. ex Moldenke, Suppl. List Invalid Names 11, in syn. 1941 [not V. tomentosa Pav., 1940, nor Sessé & Moc., 1940].

Literature: A. L. Juss., Ann. Mus. Paris 7: 77. 1806; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Trop. Woods 64: 38--39. 1940; Moldenke, Suppl. List Invalid Names 11. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 75. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Pickel, Piso e Marcgrave Bot. Bras. 87. 1949.

Shrub or tree, at least 1.5 m. tall; branchlets slender, obtusely tetragonal, rather densely puberulent throughout, corky, the bark flaking off, slightly compressed and ampliate at the nodes, not very medullose; twigs very slender, mostly short, tetragonal, usually decidedly flattened or compressed, often sulcate, densely pubescent with decidedly ferruginous or fulvous pubescence; nodes obscurely or not at all annulate; principal internodes 1--6.5 cm. long; leaves decussate-opposite, 3-foliolate; petioles rather slender or stoutish, 2--7 cm. long, densely ferruginous-pubescent like the twigs, flattened and often subcanaliculate above, not conspicuously ampliate at the base; leaflets normally subequal in size, rarely one or both of the lateral ones somewhat smaller, sessile, submembranous or thin-chartaceous, dark-green on both surfaces or somewhat lighter beneath, the central one oblong or elliptic, 3--10.7 cm. long, 1.3--3.9 cm. wide, varying from rounded to acute or very shortly acuminate at the apex, entire, acute or somewhat attenuate at the base, very densely velutinous-villous above, very densely villous-tomentose beneath, the tomentum flavescent or fulvous, the lateral ones similar in all respects but usually less attenuate at the base; midrib slender, flat or subprominulent above, prominent beneath, usually more densely villous than the lamina on both surfaces; secondaries slender, 7--12 per side, ascending, usually not much arcuate, flat and often more or less obscure above, prominulent beneath, not very conspicuously joined; vein and veinlet reticulation usually indiscernible because of the tomentum on both surfaces; inflorescence axillary, cymose, 4--7 cm. long, 2--4 cm. wide, once or twice furcate with a central flower between the branches, few- to many-flowered, rather dense, densely ferruginous- or flavescent-pubescent or subvillous throughout; peduncles rather slender, opposite, 2--4 cm. long, densely pubescent-tomentose like the petioles, usually conspicuously flattened; pedicels obsolete or to 2 mm. long and densely villous-pubescent; bractlets oblong, sessile, to 1 cm.

long, densely tomentose; prophylla linear, 1—2 mm. long, hidden in the tomentum; calyx campanulate, 3—4 mm. long and wide, very densely rufous-tomentose, its rim shortly 5-toothed; corolla hypocrateriform, blue or violet, its tube broadly cylindric, about 1 cm. long, very densely rufous-tomentose outside, the limb 1—1.5 cm. wide, 2-lipped, the 4 small lobes 3—4 mm. long, oblong-elliptic, about 2 mm. wide, obtuse, the central basal lobe much enlarged, 8 mm. or more long and 6 mm. wide, spatulate-obovate, pubescent at the base within, all the lobes tomentose on the outside; stamens of 2 lengths, exserted; style exserted; fruiting-calyx and fruit not known.

The type of this endemic Brazilian species was collected by Vandelli somewhere in Brazil in or before 1790, and is deposited in the Jussieu Herbarium at the Muséum National d'Histoire Naturelle in Paris. The type of *V. perriana* was collected by Jacques Samuel Blanchet (*no. 3434*) at Igreja Velha, Bahia, Brazil, in 1841, although some of the isotypes bear labels reading "Jacobina" or "1837". The species has been collected in anthesis in September, November, and December, and has been confused with *V. polygama* Cham. Pickel, in the reference cited above, records the common name "iba purunga". Another vernacular name is "tamanqueiro".

Citations: BRAZIL: Bahia: *Blanchet 3434* [Macbride photos 30187 & 34303] (B, Bm, Br, Cb, Cb, Cb, Cp, Dc, F—520960, F—876596, F—923151—photo, F—976258—photo, F—998444, F—1024492, K, K, Kr—photo, Kr—photo, M, N—photo, N—photo, P, P, V, V, X), *s.n.* [1857] (Cb, N); *Herb. Bernhardi s.n.* (B); *Zehntner 5033* (Mu, N—photo, Z—photo). Parahyba: *Moraes Vasconcellos 564* [Pickel 2795] (It, Sf, Ug), *2795* (N). Pernambuco: *G. Gardner 2939*, in part (Bm, K). Piauhy: *G. Gardner 2939*, in part (K). Rio de Janeiro: *Brade 18022* [Herb. Jard. Bot. Rio de Janeiro 55411] (N). State undetermined: *Herb. Martius s.n.* (Br, N—photo, Z—photo); *Vandelli s.n.* [1790; Herb. Jussieu 5050; Macbride photos 39501] (F—1039119—photo of type, Kr—photo of type, Mi—photo of type, N—photo of type, P—type, Z—photo of type); *Zehntner 659* (Ja—32262).

VITEX RUFESCENS var. ABLUDENS (Moldenke) Moldenke, Phytologia 2: 477. 1948.

Synonymy: *Vitex perriana* var. *abludens* Moldenke, Alph. List Common Names 21, hyponym; Trop. Woods 64: 39. 1940.

Literature: Moldenke, Alph. List Common Names 21. 1939; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Trop. Woods 64: 39. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Phytologia 2: 121 (1944) and 477. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949.

This variety differs from the typical form of the species in its mostly longer petioles (which are usually 6.5—7.5 cm. long) and larger leaflets which are broadly elliptic, to 14.5 cm.

long and 7 cm. wide, varying from rounded or obtuse to emarginate at the apex. The pubescence on the upper leaflet-surface (which is brunnescent in drying) is also sparser and shorter.

The type of this variety was collected by Jacques Samuel Blanchet (no. 241) somewhere in Bahia, Brazil, probably in 1844, and is deposited in the herbarium of the Naturhistorisches Museum in Vienna. It is possible that the Glocker collection cited below is part of the type collection. On the Pickel collection cited below the petioles are only 4.5—6.5 cm. long and the corollas are described as violet in color. The collector records the common name "Maria molle".

Citations: BRAZIL: Bahia: Blanchet 241 [Macbride photos 34359] (Cb—isotype, E—photo of type, F—977226—photo of type, Kr—photo of type, N—photo of type, N—photo of type, P—isotype, V—type, Z—photo of type); Glocker 241 (Bm, N). Parahyba: Xavier 1318 [Herb. Jard. Bot. Rio de Janeiro 61592] (N). Pernambuco: Pickel 519 (B, N, N—photo, Z—photo).

VITEX SAMPSONI Hance, Journ. Bot. 6: 115. 1868.

Synonymy: Vitex sampsonii Hance ex Worsdell, Ind. Lond. Suppl. 2: 501, sphalm. 1941.

Literature: Hance, Journ. Bot. 6: 115. 1868; Jacks., Ind. Kew. 2: 1214. 1895; P'ei, Mem. Sci. Soc. China 1 (3): 93, 109, & 193, pl. 21. 1932; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 57 & 104. 1942; H. N. & A. L. Moldenke, Plant Life 2: 81. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 133 & 202. 1949.

Illustrations: P'ei, Mem. Sci. Soc. China 1 (3): pl. 21. 1932.

Branches compressed-tetragonal, crisp-pilose; petioles as long as the leaflets, canaliculate above; leaves 3—5-foliolate; leaflet-blades abbreviated, resembling the leaves of Phyla nodiflora in size and shape, cuneate-spatulate, acute at the apex, entire toward the base, with 3—5 teeth on each margin above the middle, reticulate-venose, paler beneath, the lowest ones always completely entire; peduncles short; cymes forming simple axillary and interrupted terminal panicles; calyx 5-fid to about the middle, the segments acute; corolla violet, three times as long as the calyx, white-pilose on the outside; stamens and pistil exserted; fruiting-calyx and fruit not known.

The species is named in honor of Theophilus Sampson, an English plant collector who botanized in China for 31 years and who collected the type (no. 13841) along roadsides near Ting-ú-shán, Canton, China, on May 26, 1867. It is found in streambeds and on the shores of rivers and has been collected in anthesis in June and August. It has been confused in the past by herbarium workers with V. cannabifolia Sieb. & Zucc. and with V. incisa Lam.

Citations: CHINA: Kwangtung: Lau 20351 (Bz—25135, Er, N); Levine s.n. [Herb. Canton Chr. Coll. 746] (Ph); T. Sampson 13841 (N—isotype, N—photo of isotype, T—isotype).

VITEX SCABRA Wall., Numer. List [48], no. 1758, hyponym. 1829.

Literature: Wall., Numer. List [48], no. 1758. 1829; Jacks., Ind. Kew. 2: 1214. 1895; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 202 & 214. 1949.

Nothing is known of this species except that Wallich published the name as "Vitex ? scabra Wall." and based it on his no. 1758, collected at Segaen, Burma, in 1826. No formal description appears ever to have been published.

VITEX SCANDENS Moldenke, Phytologia 4: 63—64. 1952.

Synonymy: ?Vitex pycnophylla K. Schum. ex Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 133, hyponym. 1895.

Liana; branches rather slender, round in cross-section, many-striate, glabrous; nodes not annulate; principal internodes 2—4 cm. long; leaves decussate-opposite, 5-foliolate; petioles slender, 6—10 cm. long, glabrous; leaflets sessile, membranous, dark-green above, lighter beneath, elliptic, short-acuminate at the apex, entire, acuminately attenuate at the base, glabrous on both surfaces, the central one 11—15 cm. long and 4.3—5.6 cm. wide, the lateral ones slightly smaller; midrib slender, flat above, prominent beneath; secondaries filiform, 11—15 per side, flat above, subprominulous beneath, widely spreading, arcuate only near the margins, not anastomosing; veinlet reticulation mostly indiscernible above, the larger parts somewhat subprominulous beneath in drying; inflorescence apparently subterminal, paniculate, about 15 cm. long and 4 cm. wide; peduncles slender, similar to the branchlets in color and texture, about 5 cm. long; sympodia similar, several, elongate to 4 cm. at the base, glabrous, striate, nigrescent; panicle-branches very slender, 1.5—2.7 cm. long, glabrous or very minutely pulverulent, cymosely branched; pedicels filiform, about 2 mm. long, minutely pulverulent-lepidote; bractlets linear, about 1 mm. long, lepidote; calyx campanulate, about 3 mm. long and wide, glabrous or minutely scattered-lepidote, nigrescent in drying, its rim deeply 4-toothed; corolla rose, about 1 cm. long in bud, densely incanous-puberulent on the outside; fruiting-calyx and fruit not known.

The type of this remarkable species with such a decided bignoniaceous aspect was collected by Willem Marius Docters van Leeuwen-Reijnvaan (no. 10703) at Exoedition Bivouac in the Nassau Mountains, Dutch New Guinea, in October of 1926, and is deposited in the Herbarium Bogoriense at Buitenzorg. It is known thus far only from the type collection. There never has been a description published for Vitex pycnophylla. Briquet merely states that it is a vine — presumably the only scandent species known to him. I assume, therefore, that it refers to the present species.

Citations: NEW GUINEA: Dutch New Guinea: Docters van Leeuwen-Reijnvaan 10703 (Bz—72698—type, N—isotype, N—photo of type, Z—photo of type).

VITEX SCHAUERIANA Moldenke, Revist. Sudam. Bot. 5: 3. 1937.

Synonymy: Vitex montevidensis var. parviflora Schau. in A. DC., Prodr. 11: 689. 1847 [not V. parviflora A. L. Juss., Ann. Mus. Hist. Nat. Paris 7: 76. 1806].

Literature: Schau. in A. DC., Prodr. 11: 689. 1847; Glaz., Bull. Soc. Bot. France Mém. 3: 547. 1911; Moldenke, Revist. Sudam. Bot. 5: 3. 1937; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Prelim. Alph. List Invalid Names 51. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39. 1942; Moldenke, Alph. List Invalid Names 54. 1942; Moldenke, Phytologia 2: 122. 1944; H. N. & A. L. Moldenke, Plant Life 2: 81. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949.

Shrub or tree, to 14 m. tall; trunk to 13 cm. in diameter; branchlets slender, gray, obtusely tetragonal, densely short-puberulent, becoming subglabrate in age; twigs slender, brown, very obtusely tetragonal or somewhat compressed, not conspicuously lenticellate, densely short-pubescent or puberulent with yellowish or brownish hairs, becoming less conspicuously so in age; nodes not annulate; principal internodes 0.3—6 cm. long, often greatly abbreviated throughout; leaves decussate-opposite or subopposite, 3—5-foliolate, mostly 5-foliolate; petioles slender, 3—7 cm. long, convex beneath, flattened above, more or less puberulent throughout, often slightly ampliate at the base and disciform at the apex; leaflets usually quite unequal in size, the lateral ones decidedly smaller than the central one, all subsessile or obscurely stipitate on deeply canaliculate and distinctly margined petiolules 1—2 mm. long; leaflet-blades rather thin-chartaceous, rather uniformly bright-green on both surfaces or lighter beneath, the central one oblong or narrowly elliptic, occasionally oblanceolate, 3.2—14.5 cm. long, 1.4—5.5 cm. wide, acuminate at the apex or subcaudate, the acumination itself usually blunt at the apex, entire, acute at the base, sometimes slightly inequilateral, glabrous and shiny above, obscurely puberulent-strigillose along the larger venation beneath or densely barbellate in the axils, becoming glabrous, the lateral ones similar in all respects only usually considerably smaller and usually less acuminate at the apex; midrib slender, flat or subimpressed above, prominent beneath; secondaries slender, 8—18 per side, ascending, rather straight and arcuate only near the margins where they are arcuately joined beneath, subprominulous above, prominulous beneath; vein and veinlet reticulation abundant, fine, subprominulous throughout on both surfaces; inflorescence axillary, capitate, 5.5—8.5 cm. long, 1.2—2 cm. wide, densely many-flowered; peduncles slender, 4.5—7 cm. long, flattened, more or less puberulent throughout; pedicels obsolete or slender and about 1 mm. long and densely puberulous or short-pubescent with cinereous hairs; bractlets abundant, simple or 3-foliolate, stipitate, to 1 cm. long; prophylla minute, hidden; calyx campanulate, 2.5—3 mm. long, about 3 mm. wide, densely short-pubescent with appressed sordid-cinereous antrorse hairs, its rim

5-dentate, the teeth less than 1 mm. long, sharply acute; corolla blue or violet, hypocrateriform, densely pubescent-tomentellous on the outside, its tube broadly cylindric, about 5 mm. long, its upper and lateral lobes about 3 mm. long, the large inferior lip 6—8 mm. long and wide; stamens and style short-exserted; fruiting-calyx short-campanulate or patelliform, nigrescent, incrassate, 2—3 mm. long, 4—6 mm. wide, very minutely puberulous, its rim truncate, practically entire; fruit oblong-elliptic, drupaceous, nigrescent in drying, about 1 cm. long, 5-6 mm. wide, glabrous.

The variety on which this species is founded was based by Schauer on an unnumbered Riedel collection and on Blanchet 2782 from Serra d'Acurua, Rio São Francisco, Bahia, Brazil, collected in 1839. The Riedel collection is apparently in the Leningrad herbarium and has not been seen by me as yet. Schauer was of the opinion that V. bignonioides H.B.K. might belong here, but actually that binomial is a synonym of V. capitata Vahl. The Glaziou specimens cited below mostly bear labels reading "Rio de Janeiro", but nos. 13057 and 14160 were collected in Minas Gerais according to Glaziou's own published report.

The species inhabits high land, rocky soil, old clearings, terra firma, woods, matta, and caatinga, and has been collected in anthesis from January to March, and in fruit in February and March. Common names are "taruman", "taruman-sinho", "tarumansinho", and "tarumasinho". Glaziou lists "ipé branco" and "maminha de cadella" as common names for his no. 11319, which he erroneously determined as V. sellowiana Cham.

Many specimens of this species have been confused with and distributed by herbarium workers as V. montevidensis Cham. and even as Olytra flaccida Doell. The Zehntner collection cited below was regarded by Mansfeld as intermediate between V. bignonioides and V. montevidensis. The name "ipé branco" is applied also to V. mexiae Moldenke.

Citations: BRAZIL: Bahia: Blanchet 2782 [Macbride photos 30188 & 34300] (B--cotype, Bm--cotype, Br--cotype, Br--cotype, Cb--cotype, Cb--cotype, Dc--cotype, Ed--cotype, F--876594--cotype, F--976278--photo of cotype, F--923152--photo of cotype, K--cotype, K--cotype, Kr--photo of cotype, Kr--photo of cotype, Lu--cotype, M--cotype, Mi--photo of cotype, N--photo of cotype, N--photo of cotype, N--photo of cotype, V--cotype, X--cotype, Z--photo of cotype); Fróes 20182 (Be--15518, N); Zehntner 4065 (B, E--photo, Mu, Mu, N--photo, Z--photo). Maranhão: Fróes 11583 (N, S), 11587 (N, S). Minas Gerais: Glaziou 13057 (B, B, Br, Br, Cb, Cp, F--538690, K, N, N--photo, P, Z--photo), 14160 (B, Br, Cb, Cp, K, N, N--photo, P, P, P, W--1112492, Z--photo). Rio de Janeiro: Barros 1222 [Herb. Jard. Bot. Rio de Janeiro 47599] (N); Glaziou 11319 (B, Cp, K, P); Luetzelburg 6945 (B). São Paulo: F. C. Hoehne s.n. [January 15, 1919] (N, N, Sp--3069). State undetermined: Blanchet s.n. (Dr); Herb. Douville s.n. (Cb).

VITEX SCHOMBURGKIANA Schau. in A. DC., Prodr. 11: 690. 1847.

Synonymy: Vitex capitata var. Benth. in Hook., Journ. Bot. 2: 53. 1839. Oxalis guayanensis R. Kn. ex Moldenke, Prelim. Alph. List Invalid Names 33, in syn. 1940.

Literature: Benth. in Hook., Journ. Bot. 2: 53. 1839; Benth., Ann. Nat. Hist. 2: 449. 1839; Linnaea 20: 483. 1847; Schau. in A. DC., Prodr. 11: 690. 1847; Moldenke, Geogr. Distrib. Avicenn. 21 & 27. 1939; Moldenke, Prelim. Alph. List Invalid Names 33 & 50. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 33, 39, & 104. 1942; Moldenke, Alph. List Invalid Names 34 & 52. 1942; H. N. & A. L. Moldenke, Plant Life 2: 82. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 67, 95, & 202. 1949.

Shrub or spreading tree, to 20 m. tall; branchlets slender, woody, subterete or very obtusely tetragonal, grayish, minutely puberulent, subglabrate in age, not noticeably lenticellate; twigs very slender, obtusely tetragonal or flattened, very densely short-pubescent with brownish velutinous pubescence; nodes not annulate; principal internodes 1--7 cm. long; leaf-scars rather small, not much elevated nor corky; leaves decussate-opposite, 5--7-foliolate; petioles very slender, 2--6.5 cm. long, convex beneath, concave and canaliculate above, very densely short-pubescent with brownish velutinous pubescence, not noticeably ampliate at the base nor apex; leaflets subequal or the lowermost ones considerably smaller, all sessile or subsessile; leaflet-blades thin-chartaceous or submembranous, dark-green above (often brunnescent in drying), much lighter beneath, the central one oblong-elliptic, narrow-elliptic, or lanceolate, 3-11.5 cm. long, 1.2--5.3 cm. wide, long-acuminate or subcaudate at the apex, entire, acute or acuminate at the base, very minutely and sparsely strigillose-pulverulent above when immature, glabrous in age except for the pulverulent midrib, densely velutinous-tomentellous beneath with brownish pubescence, the lateral ones similar in all respects but usually smaller; midrib slender, flat or subimpressed above, prominulent beneath; secondaries slender, 7--17 per side, ascending, usually not much arcuate except at the margins where they are rather obscurely arcuate-joined beneath, flat above and usually not very conspicuous, slightly prominulent beneath, often obscured by the dense tomentum; vein and veinlet reticulation fine, abundant, subprominulent above on mature leaves (obscure on immature ones), usually hidden or indiscernible beneath; inflorescence axillary, capitate, 6--12.5 cm. long, 1.5--2.5 cm. wide, rarely branched with numerous slender branches arranged in umbelloid fashion, densely many-flowered, canescent- or sordid-puberulent or short-pubescent throughout, numerous; peduncles slender, 4.5--8.8 cm. long, brown in drying, flattened, puberulent or short-pubescent; pedicels mostly obsolete, rarely present and 1--3 mm. long on branched inflorescences; foliaceous bracts none; bractlets and prophylla linear or setaceous, 1--2 mm. long or less, densely short-pubescent with canescent hairs; calyx campanulate, small, about 2 mm. long and wide or less, densely short-pubescent with sordid-gray hairs, its rim minutely and obscurely 5-

denticulate; corolla hypocrateriform, light-blue or pale-blue, its tube broadly cylindric, about 5 mm. long, puberulent or short-pubescent above the calyx, its limb minutely puberulent inside, densely short-pubescent beneath, the 4 smaller lobes oblong-elliptic, about 3 mm. long, obtuse, the central lower lobe much enlarged, about 6 mm. long, rounded, clawed, densely bearded at the base; stamens and style somewhat exserted; fruiting-calyx very shallowly cupuliform, about 2 mm. long and 4--5 mm. wide, slightly strigillose or pilosulous on the outside, very shiny within, its rim very obscurely apiculate; fruit drupaceous, oval, nigrescent, about 3 times as long as the calyx.

The type of this species was collected on campos in British Guiana by Sir Moritz Richard Schomburgk (no. 421) — in whose honor it is named — in February, 1842. The species inhabits forests, the edges of woods, low swales, brushland bordering streams, and campos in Brutish Guiana and northern Brazil. It has been considered to be a variety of V. capitata Vahl by Bentham. Schauer states that the corolla-limb is glabrous at its base, but this is not true in the specimens examined by me, where the lower lip is very densely barbate to its base.

The species has been collected in anthesis from February to April, and in fruit in February. In Linnaea 20: 483 (1847) it is stated that this species is closely related to V. capitata Vahl, V. flavens H.B.K., and V. sellowiana Cham., from all of which it may be distinguished by the character of its pubescence, leaflets, calyx, and corolla.

Citations: BRITISH GUIANA: Irwin 585 (W—2221848); G. R. M. Pollard 61 (K); M. R. Schomburgk 129 (Bm), 129.5 (K), 288 (Cb, K, N, P), 421 [Macbride photos 17566] (B—isotype, B—isotype, B—isotype, B—isotype, F—663045—photo of type, K—isotype, K-isotype, Kr—photo of type, N—isotype, N—photo of isotype), s. n. (B, Le); A. C. Smith 3232 (F—1016026, N, S). BRAZIL: Amazonas: Ule 7862 (B, K).

VITEX SCHOMBURGKIANA var. GRANDIFLORA Moldenke, Geogr. Distrib. Avicenn. 27, nom. nud. 1939; Phytologia 1: 490. 1941.

Literature: Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Phytologia 1: 490. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104 (1942) and [ed. 2], 95 & 202. 1949.

This variety differs from the typical form of the species in its larger flowers, the corolla-tube of which being 7--8 or more mm. long, its limb about 10 mm. wide, and in its brachiate cymes, the cyme-branches often to 2 cm. long and very divergent.

The type of the variety was collected by Gustav Wallis (no. 64) on the Rio Branco, Brazil, and is deposited in the herbarium of the Botanisches Museum at Berlin. It is known thus far only from the original collection.

Citations: BRAZIL: Rio Branco: Wallis 64 (B--type, N—isotype, N—photo of type, Z—photo of type).

VITEX SEBESIAE H. J. Lam ex Docters van Leeuwen, Bull. Jard.

Bot. Buitenz., ser. 3, 4: 311 & 314, hyponym. 1922; Bull. Jard. Bot. Buitenz., ser. 3, 5: 176--177. 1922.

Literature: Docters van Leeuwen, Bull. Jard. Bot. Buitenz., ser. 3, 4: 311 & 314. 1922; H. J. Lam, Bull. Jard. Bot. Buitenz., ser. 3, 5: 176--177. 1922; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 66 & 104 (1942) and [ed. 2], 148 & 202. 1949.

Tree, about 10 m. tall; branches thick, tetragonal with rather obtuse angles, minutely longitudinally striate, glabrous but densely yellow-glandulose with minute glands, especially at the nodes; leaves decussate-opposite, 5- (or sometimes 6-) foliolate; petioles 10--12.7 cm. long, 1.5--2 mm. in diameter, yellow-glandulose and minutely pulverulent; leaflets petiolulate, the blades chartaceous, obovate or oblong-obovate, abruptly acuminate at the apex (the acumen itself obtuse), usually inequilateral and shortly decurrent at the base, glabrous above, becoming gray-fulvous in drying, and with very many minute areolae or hidden glands, dark beneath in drying and also marked with very many minute glands which are sometimes yellowish, minutely and sparsely pilose on both surfaces, the central one about 18 cm. long and 8.9--10.2 cm. wide, on a petiolule 3.1--4.2 cm. long, the lateral ones 14--18.5 cm. long and 6.8--10 cm. wide, on petiolules 1.1--2 cm. long, the basal ones 6.2--14 cm. long and 2--3.7 cm. wide, on petiolules 4--8 mm. long, the petiolules yellow-glandulose and minutely pulverulent; midrib scarcely prominent above, short-pilose with crisped hairs, rather sparsely pilose beneath; secondaries 9--11, diverging from the midrib at an angle of 45°, somewhat arcuate toward the margins, short-pilose with crisped hairs above, rather sparsely pilose beneath; tertiaries numerous, parallel to each other, regular, rather straight, joining the secondaries, forming a reticulum near the margins, rather sparsely pilose beneath; inflorescence terminal, sometimes thyrsiform, dense, eventually interrupted, 12--13 cm. long, 2.5--5 cm. wide, composed of small cymes which are binary, decussate-opposite, 2--5 times dichotomous, 4--32-flowered, 0.9--2.5 cm. long, and 0.9--3 cm. wide; peduncles 2--6 mm. long, pulverulent; bracts caducous; pedicels 2 mm. long, pulverulent; bractlets minute, about 1.25 mm. long, linear, caducous; calyx urceolate, about 3 mm. long, glabrous within, pulverulent outside, with a gland at its base, its rim 5-dentate, the teeth regular, minute; flower-buds densely pulverulent and glandulose except for the lower part of the corolla-tube; corolla violet, its tube about 8 mm. long, the lower 3.5 mm. straight, beyond that dilated and curvate, the upper lip 2-lobed, the lobes obtusely deltoid and about 2 mm. long, the lower lip 3-lobed, the 2 lateral lobes obtusely deltoid and about 3 mm. long, the central lobe or labellum about 5 mm. long and 6 mm. wide, irregularly sinuate along the margin and barbate above the base, the lobes and upper portion of the corolla-tube densely pulverulent and glandulose on the outer surface except for the margins of the labellum, glabrous inside except for the barbate base of the labellum; stamens subdidynamous, inserted in that part of the corolla-tube which is pilose on the outside, exserted about 4 mm. from the corolla-mouth; filaments glabrous; anthers about 1 mm. long, the mature thecae semilunate, divergent or sometimes some continuous; style glabrous, exserted about 6 mm. from the corolla-mouth; stigma bifid, its branches about 0.5 mm. long; ovary conic, glabrous or somewhat glandulose; fruit globose, about 7 mm. in diameter, included in the lower part of the fruiting-calyx, glabrous.

The type of this species was collected by Willem Marius Docters van Leeuwen-Reijnvaan (no. 5355) at the edge of a jungle, 100 meters altitude, on Sebesi Island in the Sunda Strait between Java and Sumatra, on April 28, 1921, and is deposited in the Herbarium Bogoriense at Buitenzorg. The leaves of the type and only known collection are infested by galls made by a gall-mite. The galls are small, mostly circular or oval patches of a granular appearance on the under leaflet-surface, with a slight concavity on the upper surface.

Lam states that the species is apparently closely related to V. quinata (Lour.) F. N. Will., but may be distinguished by its coarser, broader, obovate leaflets, much longer petioles and petiolules, and violet corollas. In V. quinata (which Dr. Lam calls V. heterophylla var. genuina H. J. Lam) the leaves are "always narrow-elliptic", according to this distinguished authority on the Verbenaceae of the Pacific area. However, I have found them to vary from oblong-elliptic to oblanceolate or even subobovate.

Citations: LESSER SUNDA ISLANDS: Sebesi: Docters van Leeuwen-Reijnvaan 5355 (Bz—25136—type, Bz—25137—isotype, N—photo of type, Z—photo of type).

VITEX SECUNDIFLORA H. Hallier, Meded. Rijks Herb. Leid. 37: 49—50. 1918.

Literature: H. Hallier, Meded. Rijks Herb. Leid. 37: 49—50. 1918; H. J. Lam, Verbenac. Malay. Arch. 168, 198—199, & 370. 1919; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 65 & 104 (1942) and [ed. 2], 146 & 202. 1949.

Tree, about 10 m. tall; branchlets tetragonal; petioles glabrous; intrapetiolar margins present, without hairs; leaves 3—5-foliolate; petioles 3.5—10 cm. long, the upper ones often winged and then 5—6 mm. wide (including the wings); leaflets subsessile, the blades obovate or obovate-elliptic, narrowly obtuse or acuminate at the apex, entire, varying from narrowly obtuse to acute or acuminate at the base, chartaceous, glabrous on both surfaces, the veinlet reticulum conspicuous on both surfaces, the central one 8—13 cm. long and 2.5—5 cm. wide, on a petiolule 1—2 mm. long; inflorescence terminal, paniculate, 14—20 cm. long, 8—10 cm. wide, very minutely pubescent; pedicels about 1 mm. long; calyx cyathiform, about 2 mm. long, glabrous, with peltate scales toward the rim, the rim 5-toothed, the teeth ciliate; corolla-tube 4—5 mm. long, infundibular, glabrous, with some scales, villous in the throat, the lip densely villous within, all the lobes pubescent near their margins, four about 2 mm. long and wide, the fifth 4—5 mm. long and 3 mm. wide.

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS VITEX. X

Harold N. Moldenke

VITEX SECUNDIFLORA H. Hallier

Stamens exserted about 4 mm. from the corolla-mouth; filaments villous at the base; style about 1 cm. long; stigma shortly bifid; ovary glabrous; fruiting-calyx enlarged, to 3 mm. long and 5 mm. wide; fruit drupaceous, about 4 mm. long (possibly not ripe).

The type of this species was collected by Pieter Willem Korthals at Gunung Pamatton, in southeastern Borneo. A common name is "halaban tandoek". Hallier refers to the scales on the calyx and corolla as glands. It has been collected at 100 meters altitude.

Citations: BORNEO: Dachlan 37 [Z. O. B. 3513; Boschproefst. BB.10715] (Bz--25143, Bz--25144); Endert 2617 (Bz--72387); Obi 98 [Z. O. B. 3444; Boschproefst. BB.10580] (Bz--25142, Bz--25669, Er, N, Ut--93575), 100 [Z. O. B. 3446; Boschproefst. BB.10582] (Bz--25140, Bz--25141, Bz--25670, N--photo, Z--photo); Verhoef I/2 [Boschproefst. BB.13038] (Bz--25138, Bz--25139).

VITEX SEINERI Gürke ex Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 47, 60, & 84. 1928; Fedde, Repert. 26: 164. 1929.

Literature: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 47, 60, & 84. 1928; Pieper in Fedde, Repert. 26: 164. 1929; Hill, Ind. Kew. Suppl. 8: 249. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 82. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 119 & 202. 1949.

Shrub; branches obtusely angular, pubescent; leaves often ternate, 5- or 7-foliolate; petioles 10 cm. long, cinereous-pubescent; petiolules about 1 cm. long; leaflet-blades chartaceous, obovate-cuneate, short-apiculate at the apex, scabrous above, incanous-hirtous beneath, many-nerved, the central one about 10 cm. long and 4 cm. wide; inflorescence axillary, contracted, few-flowered, shorter than the subtending petiole, incanous-pubescent; peduncles 4--6 cm. long; cymes about 1.5 cm. long and 3 cm. wide; bracts to 1 cm. long, linear-lanceolate; bractlets linear, about 4 mm. long; calyx campanulate, sericeous-pilose on the outside, its rim deeply split into 5 equal teeth; immature corolla subcurvate, glandulose outside on the upper part, the lobes incanous-pilose; ovary globose, sparsely glandulose at the apex; fruiting-calyx and fruit not known.

The type of this species was collected by Franz Seiner (no. 123) -- in whose honor it is named -- at Livingstone, Northern Rhodesia, and is deposited in the herbarium of the Botanisches Museum at Berlin. It is known thus far only from the original collection.

VITEX SELLOWIANA Cham., Linnaea 7: 108--109. 1832.

Synonymy: Vitex sellowiana var. grandiflora Schau. in Mart., Fl. Bras. 9: 299. 1851.

Literature: Cham., Linnaea 7: 108--109. 1832; Schau. in A. DC., Prodr. 11: 689. 1847; Schau. in Mart., Fl. Bras. 9: 298--299. 1851; Navarro de Andrade & Vecchi, Bois Indig. São Paulo 280. 1916; Moldenke, Alph. List Common Names 21 & 29. 1939; Moldenke, Geogr. Distrib. Avicenn. 27 & 40. 1939; Moldenke, Prelim. Alph. List Invalid Names 52. 1940; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39, 75, & 104. 1942; Moldenke, Alph. List Invalid Names 55. 1942; Moldenke, Phytologia 2: 122. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 82. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95, 166, & 202. 1949.

Illustrations: Navarro de Andrade & Vecchi, Bois Indig. São Paulo 280. 1916.

Small shrub or tree, to 6 m. tall; branchlets rather stoutish and irregular, gray, obtusely tetragonal, minutely puberulent, soon becoming glabrous, flattened and ampliate at the nodes, woody; twigs slender, brown, tetragonal, usually decidedly compressed and flattened, densely puberulent with brownish hairs, becoming more sparsely so in age; nodes mostly flattened and ampliate on older wood, not annulate; principal internodes 0.5--5 cm. long, usually abbreviated; leaf-scars very large and extremely corky, very conspicuously elevated; leaves decussate-opposite, 5-7-foliolate; petioles slender, 2.5--7.5 cm. long, convex beneath, flattened above, densely short-pubescent or puberulent with brown or brownish hairs, slightly ampliate at the base, somewhat club-shaped at the apex; leaflets mostly quite unequal in size, the lowermost ones much smaller than the central ones, all petiolulate on densely short-pubescent canaliculate and very slender petiolules 1--10 mm. long, the petiolules on the lowermost leaflets usually much shorter than those of the central ones or even obsolete; leaflet-blades chartaceous, becoming rather firm when mature, dark-green above, much lighter beneath, the central one oblong or narrow-elliptic to lanceolate or oblanceolate, 4--10.5 cm. long, 1.4--4.5 cm. wide, acute or short-acuminate at the apex, entire, acute or acuminate at the base, often somewhat attenuate into the petiolules, very minutely and obscurely pulverulent-puberulent above when young, soon becoming glabrous, densely short-pubescent beneath, the lateral ones similar in all respects but smaller and shorter-stipitate and usually less acuminate (or even obtuse) at the apex; midrib slender, impressed above, sharply prominent beneath; secondaries slender, 9--15 per side, arcuate-ascending, flat or subimpressed above, prominulent beneath, arcuately joined at the margins beneath; vein and veinlet reticulation abundant, very fine, subprominulent above, usually obscured by the pubescence beneath or the largest portions prominulent; inflorescence axillary, cymose, capitate or subumbelloid, 7--9 cm. long, 1.5--5 cm. wide, sometimes 2-branched and each branch subcapitate or umbelloid, densely many-flowered, canescent- or cinereous-short-pubescent or -puberulent throughout; peduncles slender, 5--6 cm. long, mostly flattened, brown, puberulent or short-pubescent; pedicels mostly obsolete, rarely to 1 mm. long and densely canescent; bracts none; bractlets and prophylla linear, 1--3 mm. long, canescent, or rarely the bractlets oblong or lanceolate and to 12 mm. long and 2 mm. wide; flowers subsessile; calyx short-cyathiform, 2--3 mm. long, about 2 mm. wide, puberulent or short-pubescent with appressed antrorse hairs, subbilabiate, the teeth short and exiguous, acute, the 3 upper ones slightly larger, the 2 lower ones smaller; corolla hypocrateriform, varying from pale-blue to violet or red, the tube slightly ampliate at the apex, 5--6 mm. long, densely pubescent on the outer surface, often glandular, the limb about as long as the tube, pulverulent-pubescent, the upper lip erect, obtusely 2-lobed, the lower lip 3-lobed, the middle lobe elongate, rounded, undulate along the margins and at the base, conspicuously bearded, the lateral ones oblong, obtuse, spreading; stamens bearded at the base, shortly exserted from the corolla-tube; anthers blue, nodding, the thecae divergent at the base; style filiform, as long as the stamens, glabrous; stigma shortly bifid; ovary glabrous; fruit drupaceous, obovoid-globose, about as large as a small cherry (Prunus avium).

This species was based by Chamisso on an unspecified Sellow collection which is apparently his no. 1437 from Villa Rica, Rio Grande do Sul, Brazil, and is deposited in the herbarium of the Botanisches Museum at Berlin. The unnumbered Sellow specimens in other herbaria are probably part of this same collection. The species inhabits woods, thickets, and mountaintops, ascending to 1600 meters altitude. It has been collected in anthesis in April and from August to November, and in fruit in January. Common names are "Maria preta" and "taruman". Glaziou also records the names "ipé branco" and "maminha de cadella" for this species, but if these names apply to the collections he cites then they refer to V. mexiae Moldenke and V. schaueriana Moldenke.

Schauer also cites two Riedel collections from near Santa Lucia and from near Sabara [both localities in Minas Gerais] and two Martius collections from Villa de Campanha [Minas Gerais] and from near Tacasava [Rio de Janeiro] -- the first two are probably in the Leningrad herbarium and the two latter are at Munich. I have not seen the former, but the latter are cited by me under V. mexiae. The Vitex sellowiana var. parviflora Schau. and the V. brasiliensis Mart., cited by Schauer, are now regarded as being V. mexiae.

The McFadyen collection cited below as having been cultivated on Jamaica does not actually bear any indication on its label that it represents cultivated material. However, it seems obvious that it must have originated from cultivated material. It was misidentified as V. umbrosa Sw.

Citations: BRAZIL: Minas Gerais: Ackermann s.n. [Catingas] (Br); Barbosa s.n. (Ja--5891); P. Clausen 10 (Cb, Cb, Dc--889, F--876860), 53 (Bm), 379 (B, Bm, Cb, Cb, G, V, X), 436 (Bm), 1459 (P, P, P), s.n. [August--April 1840] (B, Bm, Br, Br, Br, Br, Br, F--

600402, K, N); Gaudichaud s.n. [Herb. Imp. Brésil. 40] (P); Mello Barreto 3271 [Herb. Jard. Bot. Belo Horiz. 4731 & 4732] (F--933057, N), 8114 [Herb. Jard. Bot. Belo Horiz. 23293] (F--933060); Mendes Magalhães 1384 [Herb. Jard. Bot. Belo Horiz. 40083] (N); Saint-Hilaire B'. 783 (P, P); Schwacke 7496 (B), 8701 (B), 9597 (Cb), 12646 (Cb); Warming s.n. [Lagoa Santa] (Cp, V), s.n. [Serra da Piedade] (Bm). Rio de Janeiro: Campos Porto s.n. [Itatiaia; Herb. Rio de Janeiro 22585] (B, N--photo, S, Ut, Z--photo); Luetzelburg 6945 (Mu). São Paulo: F. C. Hoehne s.n. (Sp--3047). Rio Grande do Sul: Sellow 1437 [Macbride photos 17567] (B--isotype, B--isotype, F--663046--photo of type, Kr--photo of type, N--photo of type), s.n. [Villa Rica] (Bm--isotype, K--isotype, P--isotype, Vt--isotype). State undetermined: Collector undesignated s.n. (Bm); Herb. Rio de Janeiro 5981 (Ja); Hort. Douville s.n. (Cb); Schüch s.n. (E--photo, N, N--photo, V, V, Z--photo); Sellow 1264 [Canara] (B). CULTIVATED: Jamaica: McFadyen s.n. [Herb. Hance 9325] (Bm).

VITEX SERETI DeWild., Fl. Bas- & Moyen-Congo 3: 130--131. 1909.

Literature: DeWild., Fl. Bas- & Moyen-Congo 3: 130--131. 1909; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 45, 59, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 83. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 202. 1949.

Tree, 10--15 m. tall; branches more or less tomentose with dense yellow-ferruginous hairs; leaves 5-foliolate; petioles 8--12.5 cm. long, tomentose with brown-ferruginous hairs; petiolules about 5 mm. long, densely ferruginous-tomentose; leaflet-blades obovate-oblong, 6.5--14 cm. long, 2.5--6 cm. wide, more or less abruptly acuminate at the apex, entire, long-cuneate at the base, sparsely pilose beneath; secondaries 6--10 per side, prominulous beneath; inflorescence axillary, opposite, about 12 cm. long, lax; peduncles velutinous; pedicels 2--4 mm. long, bracteolate; calyx 2.5--4 mm. long, tomentose, its teeth triangular-acute; corolla whitish, short-tubular, the tube about 5 mm. long or twice as long as the calyx, pubescent on the outside, the anterior lobe blue.

The type of this species was collected by Féçox Seret (no. 847 -- in whose honor it is named -- at Nala, Belgian Congo, in March, 1907. It is known thus far only from the original collection.

VITEX SIAMICA F. N. Will., Bull. Herb. Boiss., sér. 2, 5: 431. 1905.

Literature: F. N. Will., Bull. Herb. Boiss., sér. 2, 5: 431. 1905; King & Gamble, Journ. Asiat. Soc. Beng. 74: 847. 1909; H. J. Lam, Verbenac. Malay. Arch. 167, 197--198, & 370. 1919; H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5: 178. 1922; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 60, 61, & 104. (1942) and [ed. 2], 138, 139, & 202. 1949.

Tree, to 13 m. tall; branchlets glabrous; leaves 1--3-foliolate; petioles 2.5--5 cm. long, glabrous; leaflet-blades coriaceous, ovate or ovate-lanceolate, acuminate or blunt at the apex, entire, rounded or cuneate at the base, glabrous, the central one 6--12.5 cm. long and 1.8--4.3 cm. wide, on petiolules about 1.2 cm. long, the lateral ones sometimes slightly asymmetric, usually about 1/3 smaller, on petiolules about 1.2 cm. long; secondaries 12--24 per side, only slightly curving toward the margins; inflorescence paniculate, terminal, with sometimes additional branches arising from the axils of the upper leaves, to 30 cm. long, many-flowered, minutely puberulous; bracts many, persistent, linear-lanceolate, 0.6--1.8 cm. long; bractlets 2 on each pedicel; pedicels slender or sometimes obsolete; flowers small; calyx campanulate, pubescent and glandulose outside, the tube about 1.2 mm. long, its rim 5-toothed, the teeth about 0.5 mm. long, acute; corolla blue or white, with the base of the tube mauve and the throat yellowish, the tube about 2.5 mm. long, pubescent on both surfaces except at the base, and with many yellow glands, the upper lip with 2 short obtuse lobes, the lower lip 3-lobed, the middle lobe longer than the lateral ones and villous on the inner surface; stamens included or nearly so; filaments thickened, villous; style rather thick, as long as the stamens; stigma shortly bifid; ovary depressed, sparsely glandulose; fruiting-calyx much enlarged, cupuliform; fruit drupaceous, globose, about 3.5 mm. in diameter, glandulose, obscurely 4-lobed.

The type of this species was collected by Charles Curtis (no. 1683) at Teruto in 1888 and at Coah in 1892, in the Langkawi Archipelago of Malaya. The species inhabits open limestone hilltops and is said by Henderson to be a common tree on limestone. It has been collected at altitudes of 100 to 1600 feet, flowering in August. A common name is "lankawi". Its inflorescence reminds one greatly of that seen in the genus Garrettia Fletcher. The Holttum 15095 collection cited below shows leaves that are 1- and 2-foliolate.

Citations: MALAYA: Kedah: Walter Fox 12720 (Bz--25151); Haniff & Nur 7079 (Bz--25152); Holttum 15095 (Bz--25150). Kelantan: M. R. Henderson 29696 (Bz--25147). Langkawi Islands: M. R. Henderson 21385 (Bz--25143). Pahang: M. R. Henderson 22269 (N), 22464 (N), 25053 (N). Rabana: M. R. Henderson 23094 (Bz--25149). State undetermined: Kiah 35309 [Kaki Bukit] (Bz--25145).

VITEX SIMPLICIFOLIA Oliv., Trans. Linn. Soc. Lond. Bot. 29: 133, pl. 130. 1875 [not V. simplicifolia C. B. Clarke, 1885].

Synonymy: Vitex diversifolia J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 323. 1900 [not V. diversifolia Kurz, 1870]. Vitex schweinfurthii J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 322. 1900 [not V. schweinfurthii Gürke, 1894]. Vitex bakeri B. L. Robinson, Proc. Amer. Acad. 51: 531. 1916.

Literature: Kurz, Rep. Veget. Andaman Isls. App. A.45 [& B. 14]. 1870; Oliv., Trans. Linn. Soc. Lond. Bot. 29: 133, pl. 130.

1875; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 586. 1885; Gürke in Engl., Bot. Jahrb. 18: 170. 1893; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 320, 322, & 323. 1900; B. L. Robinson, Proc. Amer. Acad. 51: 531. 1916; A. Chev., Expl. Bot. Afr. Occid. Franç. 1: 506. 1920; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 49, 64--65, 81, 82, & 84. 1928; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Alph. List Common Names 25. 1939; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 45, 47--49, & 104. 1942; Moldenke, Alph. List Invalid Names 52, 53, & 55. 1942; Moldenke, Phytologia 2: 122. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 82. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 109, 110, 112--114, 116, & 202. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949.

Illustrations: Oliv., Trans. Linn. Soc. Lond. Bot. 29: pl. 130. 1875; Lely, Useful Trees N. Nigeria 116. 1925.

Small tree; branchlets stout or rather stoutish, woody, obtusely tetragonal or subterete, densely short-pubescent on the youngest parts with white or drab-colored hairs, becoming glabrate (especially on the internodes) in age, gray or buff; nodes somewhat enlarged, usually annulate; principal internodes 3.5--10 cm. long; leaves decussate-opposite, subopposite, or ternate, 1--3-foliolate; petioles rather stout, 5.5--7.5 cm. long, more or less densely puberulent or glabrous, ampliate at the base, not noticeably jointed; leaflet-blades subcoriaceous, rather uniformly yellow-green or dark-green on both surfaces, shiny above, oblong or broadly elliptic, varying to obovate-cuneate or (on 1-foliolate leaves) suborbicular, from 1 1/2 to 2 times as long as wide, 8--16 cm. long, 7.7--11.5 cm. wide, varying from obtuse or abruptly short-acuminate to short-cuspidate or mucronate at the apex, irregularly sinuate-dentate or repand or even entire along the margins, obtuse or rounded at the base, often deeply divided on one side at the base into a small secondary leaflet, obscurely pubescent or glabrous above when mature, densely pubescent or puberulent with brownish hairs beneath, often matted-pubescent when young, less so when mature, the central one (on 3-foliolate leaves) short-petiolulate; midrib stout, wide and flat above, rounded-prominent and nigrescent in drying beneath; secondaries slender, 8--11 per side, flat above, prominent beneath, arcuate-ascending, arcuately joined in many loops at the margins; tertiaries very slender, mostly obscure or indiscernible above, prominulent beneath; vein and veinlet reticulation abundant, obscure or indiscernible above, prominulent beneath; inflorescence axillary, long-pedunculate, apparently only one cyme per node even on ternate-leaved specimens, 6.5--12 cm. long, lax, few-flowered, the branches densely pubescent or villous; pedicels very short; bractlets large, linear; calyx campanulate, about 3 mm. long, densely pubescent or villous, its rim 5-toothed, the teeth minute, distinct, ovate; corolla small, very hairy or villous on the outside; fruiting-calyx patelliform, 8--15 mm. wide, minutely puberulent, its rim obscurely toothed or irregularly scalloped; fruit oblong or oblong-elliptic, or even globose, about 2 cm. long and 1.5 cm. wide, fleshy, not apiculate.

The species is based on Speke & Grant 701/5, collected by D. K. S. Grant at Madi, Uganda, on his expedition to the sources of the Nile. V. schweinfurthii J. G. Baker is based on Schweinfurth 1303 from the Lao district, Dinka Territory, 1519 from Bongo, Bahr-el-Ghazal, Anglo-Egyptian Sudan, and 1953 from Djur [Jur], Seriba-Ghattas. V. diversifolia J. G. Baker is based on Barter 1096 from Lagos, Southern Nigeria, and 1644 from Nupe, Northern Nigeria. The V. schweinfurthii Gürke is a synonym of V. madiensis var. schweinfurthii (Gürke) Pieper, while V. simplicifolia C. B. Clarke is a synonym of Teijsmanniodendron hollrungii (Warb.) Kosterm.

Pieper also cites Chevalier 7535 from Ndellé, Ubangi-chari, French Equatorial Africa, and Chevalier 2767 from Sansanding, French Soudan, French West Africa, Döring 217, Kersting 36a and 555, and Schroeder 13 from Togo, and Ledermann 2911, 3273, 4070, and 4648 from Cameroons. He says that the species is closely related to the very variable V. madiensis Oliv. and that the number of leaflets and their form cannot be used to differentiate the two species. Oliver reduced to V. simplicifolia several specimens originally identified by Baker as V. vogelii, and, indeed, the leaf-form of V. vogelii is practically identical to that of V. simplicifolia as is well shown by Ledermann 4648. It is best, therefore, to regard V. vogelii as a mere variety. Baker says "An allied plant gathered by Welwitsch in Angola in the province of Golungo Alto, has occasionally two small accessory leaflets on the lower leaves of the branch. It is a shrub 6--8 feet high."

Common names recorded for V. simplicifolia are "buji", "bummehi", "bummeji", "bummere", "'dinyar biri", "'dunyar biri", "idjoli", "kourou", "kuru", "nambalerri", "panyeró buda", and "plum-tree". It has also been recorded from Gold Coast (Ghana) and Chad Territory.

Citations: ANGLO-EGYPTIAN SUDAN: Bahr-el-Ghazal: Schweinfurth 1519 (N, N--photo, S, Z--photo), 1953 (S). CAMEROONS: Mildbraed 9635 (K, N). UGANDA: Grant s.n. [Speke & Grant 701/5] (K--type, N--photo of type, Z--photo of type).

VITEX SIMPLICIFOLIA var. VOGELII (J. G. Baker) Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 65. 1928.

Synonymy: Vitex vogelii J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 319. 1900.

Literature: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 319. 1900; A. Chev., Etud. Fl. Afr. Cent. Franç. 1: 244. 1913; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 65, 84, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 47, 48, & 104. 1942; Moldenke, Alph. List Invalid Names 56. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 88. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 113, 114, & 202. 1949.

The variety differs from the typical form of the species in having always 1-foliolate leaves, with narrower leaflet-blades which are only twice as long as wide.

It is said to be a small tree, about 15 feet tall, the branchlets short-pubescent with whitish hairs, the leaves ternate, petioles 5 cm. long, leaflet-blades subcoriaceous, green, oblong, 10--12.5 cm. long, 5--6.3 cm. wide, acute at the apex, entire, subcuneate or rather rounded at the base, green and finally glabrous above, matted-pubescent beneath with persistent whitish hairs, cymes axillary, pedunculate, few-flowered, fruiting-calyx about 8 mm. in diameter, its rim obscurely lobed, and the drupe globose, about the size of a cherry (Prunus avium).

The type of the variety was collected by the ill-starred Julius Rudolph Theodor Vogel (no. 97) at Musgu, in southern Bornu, Northern Nigeria. Chevalier cites his nos. 8918 and 8921 from the region of Lake Iro, in the country of the Kabas-Maras, Ubangichari, French Equatorial Africa. It has also been recorded from Chad Territory.

VITEX SNETHLAGIANA Huber ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104 (1942) and [ed. 2], 95 & 202, nom. nud. 1949; H. N. & A. L. Moldenke, Pl. Life 2: 84, nom. nud. 1948; sp. nov.

Arbor; ramis gracilibus griseis; sarmentis brunnescentibus; foliis 1-foliolatis; petiolis gracillimis 2--2.7 cm. longis minute obscureque puberulis vel glabratis non ampliatis; petiolulis obsoletis vel usque ad 2 mm. longis marginatis; laminis tenuiter membranaceis anguste ellipticis 8--11.5 cm. longis, 2--3.3 cm. latis, obtusis integris vel subsinuatis, ad basin acutis vel subacuminatis, utrinque glabratis brunnescentibus; inflorescentiis axillaribus cymosis divaricatis laxe multifloris; pedunculis gracilibus 2 cm. longis glabratis vel obscure minuteque puberulis; pedicellis gracilibus 2--7 mm. longis subglabratis vel obscure puberulis; calyce campanulato 3 mm. longo, 4 mm. lato, subglabrato, margine subtruncato minutissime 5-dentato.

Tree; branchlets slender, gray; young twigs brunnescent in drying; leaves 1-foliolate; petioles very slender, 2--2.7 cm. long, minutely and obscurely puberulent or glabrate, not ampliate at the base; petiolules obsolete or to 2 mm. long, continuous with the petiole, margined; leaflet-blades uniformly dark-green on both surfaces, thin-membranous, narrow-elliptic, 8--11.5 cm. long, 2--3.3 cm. wide, blunt at the apex, entire or subsinuate along the margins, acute or subacuminate at the base, glabrate on both surfaces, brunnescent in drying; midrib slender, plane or subimpressed above, rounded-prominent beneath; secondaries very slender, short, 10--14 per side, arcuate-ascending, subprominulous on both surfaces, not anastomosing; vein and veinlet reticulation abundant, subprominulous on both surfaces; inflorescence axillary, cymose, divaricate, loosely many-flowered; peduncles slender, about 2 cm. long, glabrate or obscurely and minutely puberulent; cyme-branches divaricate-ascending; pedicels slender, 2--7 mm. long, subglabrate or obscurely scattered-puberulent; calyx campanulate, about 3 mm. long and 4 mm. wide, subglabrate, its rim subtruncate, very minutely 5-toothed; corolla hypocrateriform, its tube broadly cylindric, about 6 mm. long, minutely puberulent on the outer surface, its limb bilabiate, the smaller lobes 4--5 mm. long, 2--3 mm. wide, entire, obtuse, the large lower lip about 1 cm. long and 7 mm. wide, undulate-crisped along the margins, rounded, minutely puberulent on both surfaces; stamens and style exserted about 5 mm. from the corolla-mouth.

The type of this species was collected by Emil Heinrich Snethlage (Herb. Amaz. Mus. Para. 10413) -- in whose honor it is named -- somewhere in Pará, Brazil, and is deposited in the Goeldi Museum at Belém. Unfortunately, only two fragments of the type and three photographs of this interesting species have been available to me, and my description is, therefore, of necessity very incomplete. It is hoped that certain institutions that are loathe to lend their material to specialists for study and that even ignore correspondence may soon come to realize that the best interests of botanical science are not best served by such a policy of non-cooperation and isolationism which smacks strongly of provincialism.

Citations: BRAZIL: Pará: Snethlage s.n. [Herb. Amaz. Mus. Paraensis 10418; Macbride photos 10418] (F--601898--fragment & photo of type, N--fragment of isotype, N--photo of fragment of type & of phototype, Z--photo of fragment of type & of phototype).

VITEX SPRUCEI Briq., Bull. Herb. Boiss., sér. 1, 4: 346--347. 1896.

Synonymy: Vitex parviflora Spruce ex Briq., Bull. Herb. Boiss., sér. 1, 4: 347, in syn. [as "parviflorae"]. 1896; Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940 [not V. parviflora A. L. Juss., 1806]. Vitex spongiocarpa Ducke, Trop. Woods 31: 20-21. 1932.

Literature: A. L. Juss., Ann. Mus. Hist. Nat. Paris 7: 76. 1806; Briq., Bull. Herb. Boiss., sér. 1, 4: 346--347. 1896; Herter, Florula 105. 1930; Ducke, Trop. Woods 31: 20--21. 1932; Record, Trop. Woods 31: 28--29. 1932; Ducke, Arquiv. Jard. Bot. Rio Janeiro 6: 88--89. 1933; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Prelim. Alph. List Invalid Names 52. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Alph. List Invalid Names 54. 1942; Ragonese & Martínez Crovetto, Revist. Invest. Agric. 1: 202. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 84. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949; Occhioni, Lilloa 17: 485. 1949; Ducke & Black, Bol. Téc. Inst. Agron. Norte 29: 24--25. 1954.

Medium-sized or large tree, to 30 m. tall; trunk to 1.3 m. in diameter; bark thin, 3--4 mm. thick, smooth; sapwood gray, merging into pale-olive heartwood; branchlets and twigs stout or the latter more slender, rather acutely or obtusely tetragonal, conspicuously flattened and sulcate between the angles, somewhat lenticellate with greatly elongate linear lenticels, medullose, varying from minutely puberulent to pulverulent or glabrate, dark-brown or brownish in drying; nodes annulate, flattened and ampliate; buds sharp-pointed; principal internodes 2--12.5 cm.

long, usually elongate; leaf-scars large, corky, with prominently raised margins; leaves decussate-opposite, 5-foliolate, aromatic; petioles slender or very stout and woody, 4--10.7 cm. long, conspicuously flattened and often sulcate above, convex beneath, obscurely and very minutely puberulent or pulverulent or even glabrate, often ampliate at the base, not disciform at the apex; leaflets usually unequal, the lowermost much smaller than the central ones, all petiolulate; petiolules stout, incrassate, 3--27 mm. long, nigrescent, flattened and canaliculate-margined above, minutely pulverulent or glabrate; leaflet-blades very firmly thick-chartaceous or subcoriaceous, tough, uniformly bright-green or dark-green on both surfaces or slightly lighter beneath, shiny on both surfaces, mostly brunnescent in drying, the central one elliptic or broadly elliptic, 6--25 cm. long, 2--8.5 cm. wide, rather long-acuminate or caudate at the apex, entire, acute or short-acuminate at the base, obscurely pulverulent or glabrous and nitidulous on both surfaces, the lateral ones similar but somewhat smaller, 1 or 2 of the basal ones much reduced; midrib slender, flat or subimpressed above, very much rounded-prominent beneath; secondaries very slender, usually distant, 6--13 per side, arcuate-ascending, flat above, sharply prominent beneath, arcuately joined near the margins beneath; vein and veinlet reticulation rather sparse or abundant, mostly obscure or indiscernible above, the larger portions often subprominulous beneath, the rest obscure or indiscernible; inflorescence terminal (and axillary in the uppermost leaf-axils), thyrsoid, very massive, to 40 cm. long and 32 cm. wide, composed of 1--5 pairs of lateral and opposite compound and long-stipitate panicles, each panicle composed of 2--5 pairs of rather small, opposite, long-stipitate, many-flowered cymes; peduncles, rachis, and inflorescence-branches rather stoutish, dark-brown, minutely puberulent, annulate at the nodes, the ultimate parts compressed; main sympodia greatly elongate, 3--7 cm. long; secondary sympodia also elongate, minutely pulverulent-puberulent or subglabrate, brunnescent in drying; pedicels very slender, about 1 mm. long; bracts not seen, perhaps caducous; bractlets and prophylla linear, 1--3 mm. long, puberulent, caducous; calyx campanulate, 1.5--2 mm. long, ferruginous- or white-tomentellous, its rim shortly but distinctly 5-dentate, the teeth ovate, equal, 0.5--1 mm. long, acute; corolla white with a yellow spot in the center or violet and spotted or striped with yellow, 4--6 mm. long, white-sericeous on the outer surface, the tube slightly dilated toward the apex, the limb shortly bilabiate, the inferior lip larger than the other, much shorter than the tube, short-barbellate; fruiting-calyx finally split; fruit drupaceous, very large, black or reddish-black when mature, 1.5--2.5 cm. broad, not quite as long, slightly 4-tuberculate, depressed at the apex, glabrous, shiny, fleshy, the epicarp very thin, the mesocarp thick, spongy, white, the endocarp slightly crustaceous, fragile, the placental column thick and spongy.

The type of this very distinctive species was collected by Richard Spruce (no. 2767) -- in whose honor it is named -- near

Panuri, on the banks of the Rio Uaupes, Amazonas, Brazil, in December, 1852, and is deposited in the Delessert Herbarium at Geneva. The type of V. spongiocarpa was collected by Adolfo Ducke (Herb. Rio de Janeiro 22577) in swampy woods near the town of Manáos, also in Amazonas, Brazil, on October 15, 1929. The species has been collected in anthesis in March, April, June, and from October through December, and in fruit in October, December, and February. The Ducke 42a distributed as V. spongiocarpa by the Yale School of Forestry, at least insofar as the sheet 657655 in the herbarium of the Chicago Natural History Museum is concerned, is not this species nor even anything verbenaceous. The packet on the sheet contains only euphorbiaceous fruit.

Ducke states that V. sprucei is frequent in the environs of Manáos, where it was actually overlooked by previous collectors. He states that it reaches greater dimensions as a tree than any other Brazilian species of the genus with which he is familiar. It is, however, apparently surpassed in size by V. excelsa Moldenke, a species with which Ducke was not acquainted. V. sprucei is remarkable because its cymes of small, white, yellow-throated flowers are disposed in great terminal panicles, and especially on account of the voluminous spongy mesocarp of the fruits, which, during the rainy season, float in the swamps of the upland forests sometimes in considerable abundance. The blossoming trees, crowned with their wide upwardly-raised inflorescences, suggest teak (Tectona grandis L. f.) more than they do any other Brazilian species of Vitex. A detailed description of the wood anatomy is given by Record in the reference cited above. A vernacular name is "tarumá". A wood specimen of Ducke 41 is said to be Yale Mus. no. 20722, but has not as yet been seen by me. It has been collected also in wet non-inundated forests, on high ground along rivulets, and in high forests of the caatinga type.

Citations: BRAZIL: Amazonas: Ducke 41 [Herb. Yale Mus. 20721 & 20772] (A, F--657687, F--672240, Y), 41a (F--657686, N, Y), 41b (Y), 51 (F--901720, N, S), 1160 (N), s.n. [Herb. Rio de Janeiro 22577; Macbride photos 24705] (B, B, E--photo, K, K, N--photo, N--photo, P, S, Ut, W--1517711, W--1517712, Z--photo, Z--photo), s.n. [Herb. Rio de Janeiro 22578] (B, W--1499318, W--1517713); Fróes 20510 (N), 22264 (Be--23809); Spruce 2767 [Macbride photos 24705] (Bm--isotype, Br--isotype, Cb--type, Cb--isotype, Cp--isotype, Ed--isotype, F--869136--fragment of type, F--770968--photo of type, G--isotype, K--isotype, K--isotype, K--isotype, Kr--photo of type, Lu--isotype, Mi--photo of isotype, N--isotype, N--photo of isotype, N--photo of type, N--photo of type, P--isotype, X--isotype, Z--photo of type, Z--photo of isotype).

VITEX SPRUCEI var. LONGIDENTATA (Moldenke) Moldenke, Phytologia 2: 477. 1948.

Synonymy: Vitex spongiocarpa var. longidentata Moldenke, Phytologia 2: 31. 1941.

Literature: Moldenke, Phytologia 2: 31. 1941; Moldenke, Known

Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Phytologia 2: 477. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949.

This variety differs from the typical form of the species in its calyx-teeth being 1.5--2 mm. long and its bractlets and prophylla being persistent.

The type of the variety was collected by Adolfo Ducke (Herb. Rio de Janeiro 23763) in caatinga woods at Igarapé Jurupary, on an affuent of the lower Rio Uaupés, Amazonas, Brazil, on November 2, 1932, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is said to be a shrub or small tree, 2-12 m. tall, with a trunk diameter of 5--20 cm., white or rose-colored flowers, and "folhas quebradiças". It has been collected in anthesis only in November.

Citations: BRAZIL: Amazonas: Ducke s.n. [Herb. Rio de Janeiro 23763] (N—type); Fróes 21398 (Be—16845, N); Murça Pires 781 (N).

VITEX STAHELII Moldenke, Alph. List Common Names 14, hyponym. 1939; Pulle, Fl. Suriname 4 (2): 310—311. 1940.

Synonymy: Vitex staheli Moldenke, Alph. List Invalid Names Suppl. 1: 29, in syn. 1947.

Literature: Pittier, Contrib. U. S. Nat. Herb. 20: 487. 1922; Moldenke, Geogr. Distrib. Avicenn. 20—21. 1939; Moldenke, Alph. List Common Names 14. 1939; Moldenke in Pulle, Fl. Suriname 4 (2): 310—311. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 32, 33, & 104. 1942; Moldenke, Phytologia 2: 122. 1944; Moldenke, Alph. List Invalid Names Suppl. 1: 29. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 84. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 65, 67, 68, & 202. 1949.

Spreading tree, to 40 m. tall; trunk to 60 cm. in diameter, to 72.5 cm. in girth at 1.5 m. from the base, not buttressed; bark smooth, very pale gray or grayish-white, flakey, peeling off in thin thread-like strips; branches and branchlets decussate-opposite, stout or rather slender, medullose, gray or buff, becoming brownish in drying, very obtusely tetragonal or subterete, often somewhat ampliate at the nodes, minutely and rather sparsely puberulent, becoming glabrous in age; twigs stout or slender, more densely puberulent, mostly compressed and flattened when young; nodes not annulate; principal internodes 1—12 cm. long; leaf-scars large, often elevated on the ampliate nodes; leaves decussate-opposite or subopposite, 5-foliolate, very immature or absent at time of anthesis; petioles slender or stout, 5—16 cm. long, convex or keeled beneath, canaliculate above, often sulcate in drying, lightly puberulent with very minute grayish hairs, slightly ampliate at the base, slightly club-shaped (but not disciform) at the apex; leaflets mostly very unequal in size or subequal when very immature, all subsessile or short-petiolulate on petiolules that are stout, lightly and minutely puberulent, margined, and 1—6 mm. long; leaflet-blades chartaceous, uniformly dark-green on both surfaces or lighter beneath, the central one oblong or elliptic to subobovate, 9—28 cm. long, 2--9.5 cm. wide, long-acuminate or caudate at the apex, entire, acute or cuneate at the base, very minutely pulverulent-puberulent on both surfaces (especially beneath) when immature, becoming glabrous on both surfaces in age, lateral ones similar in color, texture, and puberulence, but usually much smaller and narrower; midrib slender, impressed above (on mature leaves), prominent beneath; secondaries slender, 12--21 per side, arcuate-ascending, flat or obscurely subimpressed above, prominulent beneath, arcuately joined near the apex beneath; vein and veinlet reticulation rather abundant, flat or subprominulent above, the larger portions often subprominulent beneath; inflorescence axillary, cymose, 2--5 cm. long, 0.8--2.5 cm. wide, several times branched in a subcapitate or umbelloid fashion, each branch several times dichotomous with very short branches and rather densely few- to many-flowered, lightly canescent-puberulent throughout; peduncles slender, 0.7--4 cm. long, compressed, lightly puberulent, often slightly ampliate at the apex; cyme-branches very short, flattened, marked with a denser annulation of pubescence at every node; pedicels slender, obsolete or to 1.5 mm. long, canescent-puberulent; flower-buds gray-mauve, pubescent; calyx broadly campanulate, gray-green, 2 mm. long or less, densely appressed-puberulent, the rim sinuate or indistinctly 5-dentate; corolla varying from purple, purplish-blue, or bluish-mauve to lilac or heliotrope, the throat pale-yellow or yellow, hairy, the tube curvate, about 7.5 mm. long, the exserted portion puberulent on the outside, villous within at the insertion of the stamens, the limb patent, 2-lipped, the lower lip slightly cup-shaped, the lobes ovate or oblong, obtuse, more or less puberulent externally, glabrescent within, the inferior median lobe about 9.5 mm. long, the remaining lobes about 5 mm. long; stamens erect, exserted; filaments lilac; style exserted; fruiting-calyx accrescent, patelliform; fruit drupaceous, about 7 mm. long, glabrous, glossy purple-black, 1-stoned, the flesh greenish.

The type of this species was collected at Brownsberg, Surinam (B.W., Bureau of Forestry 2480), and is deposited in the herbarium of the Botanisch Museum at Utrecht. It is named in honor of Gerold Stahel, who has done so much to advance our knowledge of the botany of Dutch Guiana. Martyn states that the species regularly bears only a few young terminal leaves at time of flowering and that the flowers are in clusters at the end of the peduncles which are regularly 1 cm. long. Davis reports that it grows to 120 feet tall, with a trunk 2 feet in diameter, very smooth grayish-white bark, and deciduous leaves. On another collection the height is given as 115 feet and the girth 34 inches at 4 1/2 feet above the base, the first branch is said to be 65 feet up, the trunk not buttressed, and the bark very pale, peeling off in thread-like strips. He says that a blaze shows up lines like annual rings. Pittier, in the reference cited above, identifies the Rusby & Squires collections as V. capitata Vahl. It has also been confused with V. cymosa Bert. and misidentified as Bignoniaceae.

It has been collected in low ropey bush, at the edge of coffee plantations, along railroad tracks, on hillslopes, in brown sand or in ochraceous clay mixed with sand, in miscellaneous forests, and growing in full exposure to the sun, at altitudes of 100 to 1650 meters, in anthesis from January to April and in September and November, and in fruit in April. Common names are "alasaobo", "hackiaballi" (in the Arawak dialect), "hakuyaballi", "panda", and "totumillo". It is of interest to note that most of these common names apply also to *V. compressa* Turcz.

Citations: COLOMBIA: Meta: *Philipson, Idrobo, & Jaramillo 2105* (Bm, N, W--2026236); *Sandeman 5788* (K). VENEZUELA: Bolívar: *Cardona 2119* (N). Delta Amacuro: *Rusby & Squires 84* (B, Bm, Cb, D, E--116203, Ed, F--160821, K, Mi, Mu--3704, N, Vu, W--325541, X, X), *257*, in part (A, A, B, Bm, Cb, D, E--116202, Ed, F--160945, K, Mu--3705, N, N, V, Vu, W--325624, X). BRITISH GUIANA: *British Guiana Forest Dept. 914* (K), *3013* [F.277] (K), *3228* [F.492] (N), *7739* [field no. JB.105] (N); *T. A. W. Davis D.46* [British Guiana Forest Dept. 1048] (K, K, N); *De la Cruz 3822* (N, N--photo, S--photo, Z--photo), *3822a* (F--544466); *Jenman 3623* (Bm, K, N, U, U); *Martyn 34* (K, U); *Record 914* (S). SURINAM: *B.W., Bureau of Forestry 2454* [tree no. 1152] (N--photo, Ut, Ut, Z--photo), *2480* [tree no. 1152] (N--isotype, N--photo of type, Ut--type, Z--photo of type), *6304* [tree no. 1152] (N--photo, Ut, Z--photo); *Stockdale 3821* (K).

VITEX STELLATA Moldenke, Phytologia 3: 448. 1951.

Small tree; branchlets stout, medullose, obtusely tetragonal, canaliculate, glaucous-gray, densely tomentellous with glaucous-stellate tips on the hairs; nodes not annulate; principal internodes 1.5--4 cm. long or longer; leaf-scars large but not especially prominent; terminal buds very densely flavescent-tomentellous; leaves decussate-opposite, 5-foliolate; petioles stout, 12-13 cm. long, densely tomentellous with the hairs conspicuously glaucous-stellate at their tips, giving the petioles a decidedly bluish cast; petiolules stout, 2--14 mm. long, the central one longest, all densely tomentellous with glaucous-stellate hairs, canaliculate above; leaflet-blades subcoriaceous, bright-green above, cinereous beneath, obovate, very densely pubescent on both surfaces, the pubescence cinereous beneath, the central ones 16--18 cm. long and 7.5--8 cm. wide, the lateral and lower ones smaller, rounded at the apex, entire and somewhat revolute along the margins, long-attenuate at the base; midrib stout, flat above, rounded-prominent beneath; secondaries slender, regular, 15--17 per side, ascending, slightly arcuate toward the margins, not anastomosing, flat above, sharply prominent beneath; veinlet reticulation abundant, mostly rather obscure above, prominulent beneath; inflorescence not known.

The species is apparently endemic to Madagascar. Lacking inflorescence, it is very possible that it is not here correctly placed, in spite of the collector's original determination of "*Vitex* sp." Its pubescence very strongly suggests *Bignoniaceae*.

The type was collected by Raymond Decary (no. 14549) at Massif de l'Ankara, Madagascar, on July 25, 1939, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

Citations: MADAGASCAR: Decary 14549 (N--isotype, N--photo of type, P--type, Z--photo of type).

VITEX STRICKERI Vatke & Hildbr., Linnaea 43: 532--533. 1882.

Synonymy: Vitex strickeri Vatke ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50 & 104, sphalm. 1942.

Literature: Vatke & Hildbr., Linnaea 43: 532--533. 1882; Gürke in Engl., Pflanzenw. Ost-Afr. C: 340. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 318. 1900; Gürke in Engl., Bot. Jahrb. 28: 463. 1900; Fries, Notizbl. Bot. Gart. Berlin 8: 702. 1924; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 42, 55, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 84. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 117, 118, & 202. 1949.

A shrub, to 2 m. tall; branchlets densely brown-pubescent with short hairs; leaves 3-foliolate; petioles about 2.5 cm. long, densely pubescent;leaflet-blades subcoriaceous, ovate, 4--5 cm. long, acute at the apex, scabrous and more or less rugose above through the impressed venation, entire or slightly dentate along the margins, densely pubescent beneath, the central one short-petiolulate; midrib and secondaries prominent beneath, impressed above; inflorescence cymose, forming a thyrsoid terminal panicle 5--10 cm. long, its branches very pubescent; pedicels very short; calyx campanulate, about 2 mm. long, pubescent, its rim minutely toothed; corolla about 6 mm. long, pubescent, its tube infundibular, the lobes very small; fruiting-calyx and fruit not known.

The type of this very variable species was collected by Johann Maria Hildebrandt (no. 1303) at Bagamovo, Tanganyika Territory. Pieper notes that the leaves vary greatly in respect to their margins and the wrinkled character of the upper surface, and that the calyx shows a decided tendency toward being two-lipped. He states that it is closely related to V. lamiana Pieper and that numerous specimens previously determined as V. strickeri are actually V. lamiana. For V. strickeri he cites Busse 2163, Conrad 186, Engler 3328, Hildebrandt 1250, Kassner 206, Kirk s.n., Kranzlin 2996, and Stuhlmann 275, 6559, 6947, 7999, and 8719 from Tanganyika Territory, and Wakefield s.n. from Kenya. It has been collected at an altitude of 3300 feet in Tanganyika. Lynes 9, not seen by me, is said to be conspecific with the Burtt 3923 cited below.

Citations: TANGANYIKA TERRITORY: Burtt 3923 (Br, N); Schlieben 5623 (N, S). KENYA: R. M. Graham 2328 (N--photo, S, Z--photo).

VITEX STYLOSA Dop, Bull. Soc. Hist. Nat. Toulouse 57: 201--202. 1928.

Literature: Dop, Bull. Soc. Hist. Nat. Toulouse 57: 210—202. 1928; Hill, Ind. Kew. Suppl. 9: 298. 1938; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 59 & 104 (1942) and [ed. 2], 137 & 203. 1949.

Small shrub; branchlets subtetragonal, glabrous; leaves 3-foliolate; petioles black in drying, about 3 cm. long, glabrous; leaflet-blades chartaceous, elliptic or obovate, 6--7 cm. long, 3--4 cm. wide, short-acuminate at the apex, acute or obtuse and often inequilateral at the base, glabrous, black and shiny above in drying, red-brown and glandulose beneath in drying, entire; secondaries small, 12--14, recurved at the margins; vein and veinlet reticulation conspicuous on both surfaces; central petiolule 1.5--2 cm. long, the lateral ones smaller; inflorescence paniculate, terminal, pyramidal, very leafy, slightly puberulent, the cymules in the form of glomerules, many-flowered, short-stipitate; bracts none or very small and caducous; pedicels obsolete or to 2 mm. long; flowers about 8 mm. long; calyx campanulate, about 3.5 mm. long, slightly puberulent, its lobes 5, small, braodly triangular; corolla puberulent externally except at the base, its tube about 5 mm. long, glabrous inside, the upper lip 2-lobed, the lobes about 2 mm. long, acute at the apex, glabrous within, the lower lip 3-lobed, the lobes acute and glabrous within, the median one about 3 mm. long; stamens exserted; filaments flattened, glabrous; anthers with recurved thecae; ovary ovoid, glabrous; style thick, about 11 mm. long, exserted; stigma 2-lobed; fruiting-calyx and fruit not known.

The type of this species was collected by Henri François Bon (no. 3898) at Kien Khé, in the Dong Hâm hills, Tonkin, Indochina. Dop points out that this species is easily distinguished by its corollas being glabrous within and by its long and thick style which surpasses the corolla in length.

VITEX SUMATRANA Miq., Fl. Ind. Bat. Suppl. 1: 567—568. 1860.

Synonymy: Vitex sumatrana var. typica H. J. Lam, Verbenac. Malay. Arch. 186--187. 1919.

Literature: Miq., Fl. Ind. Bat. Suppl. 1: 567—568. 1860; H. J. Lam, Verbenac. Malay. Arch. 167, 186--187, & 370. 1919; Moldenke, Alph. List Invalid Names 55. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 56, 64, & 104 (1942) and [ed. 2], 129, 143, 145, & 203. 1949.

A tree; branchlets tetragonal, somewhat pubescent, becoming glabrescent in age; leaves 3--5-foliolate; petioles 5—8 cm. long, glabrous; leaflet-blades chartaceous, obovate, abruptly acuminate at the apex (the acumination 9--12 mm. long), entire, acute or cuneate at the base, glabrous or subglabrous above on the lamina, but pubescent on the venation, with small white scales, sparsely pubescent and glandular beneath, the central one 6.5--14 cm. long, 4--7 cm. wide, on a petiolule [0.5?]--1.5--3 cm. long, the lateral ones 4.5--12 cm. long, 2.5--6.5 cm. wide, on petiolules 0.8—1.8 cm. long, the basal ones, when present, about 7 cm. long and 3 cm. wide, on petiolules about 0.5 cm. long; secondaries 6--10 per side; inflorescence terminal and paniculate or the lower ones axillary in the uppermost leaf-axils, narrow, 8--12 cm. long, 1.5 to 2.5 cm. wide, minutely and sparsely ferruginous-pubescent; calyx campanulate, about 3 mm. long and 2.5 mm. wide, pubescent and glandular externally, glabrous within, its rim 5-toothed, the teeth deltoid, small, with a small pimple-like swelling at the base of each; corolla about 7 mm. long in all, curvate in bud, pubescent and glandular outside, except on the lower part, entirely glabrous within or with some hairs at the base of the lip only, its tube about 4 mm. long, the lip about 2 mm. long, the lobes small, about 1 mm. long, all glabrous within; stamens didynamous, slightly exserted, inserted in the upper half of the corolla-tube; filaments stout, red, glabrous; anther-cells divaricate; style equaling the stamens; stigma shortly bifid; ovary pyriform, glabrous or somewhat glandulose at the top; fruiting-calyx enlarged, to 1.3 cm. in diameter; fruit globose, depressed, 1--1.2 cm. long, 9--10 mm. wide, somewhat beaked at the apex.

This species is based on Teijsmann 4302 H.B., 4333 H.B., and 4454 H.B. from near Natar, in the province of Lampongs, Sumatra, and probably an unnumbered collection from the same locality which is sheet no. 908267-471 in the Leiden herbarium. These are also the cotypes of Dr. Lam's var. typica. Actually only the unnumbered collection is cited by Miquel in his original description of the species, but it seems obvious that the numbered collections are part of the same gathering. The species has been collected in fruit in December, and has been misidentified in the past as V. heterophylla Roxb., V. pubescens Vahl, and V. sumatrana var. urceolata (C. B. Clarke) King & Gamble. According to Lam this species differs only in minor points from V. urceolata C. B. Clarke. In V. sumatrana the leaves are 3--5-foliolate, the leaflets are sparsely pubescent beneath, with the acumination 9--12 mm. long, the calyx is campanulate, about 3 mm. long and 2.5 mm. wide, with the teeth bullate at the base, and the corolla is 7 mm. long in all, recurved in bud, the tube 4 mm. long. In V. urceolata the leaves are always 3-foliolate, the leaflets are glabrous beneath, with an acumination absent or only to 3 mm. long, the calyx is urceolate, about 4 mm. long and 2--2.5 mm. wide, with the teeth ribbed but not bullate, and the corolla is 8--9 mm. long, not at all or but slightly curvate in bud, the tube 7 mm. long.

Citations: SUMATRA: Arsad 12 [Boschproefst. BB.9219] (Bz--24919); Bokhorst 40 [Boschproefst. BB.7723] (Bz--25160, Bz--25161, Ut--80701); Docters van Leeuwen 503 (Bz--25154); Endert E1.1326 (Bz--25163, Bz--25164); Teijsmann 4302 H.B. [no. 2] (Bz--25155--cotype, Bz--25156--cotype, Ut--11559--cotype), 4333 H.B. (Bz--25157--cotype, Bz--25158--cotype, N--photo of cotype, Z--photo of cotype), 4454 H.B. (Bz--25159--cotype, Ut--11560--cotype).

VITEX SWYNNERTONII S. Moore, Journ. Linn. Soc. Lond. Bot. 40: 168-

169. 1911.

Literature: S. Moore, Journ. Linn. Soc. Lond. Bot. 40: 168--169. 1911; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 50, 70, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 85. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 121 & 203. 1949.

Large tree; branches "often prostrate"; branchlets leafy toward their tips, fulvous-pubescent when young, finally glabrescent; leaves opposite, mostly 5-foliolate; petioles slender, to 6.5 cm. long, often much shorter; petiolule on the central leaflet about 7 mm. long, on lateral ones about 2 mm. long; leaflet-blades thin-membranous, narrowly ovate-oblong or oblong-obovate, 2.5--6 cm. long, 1--3 cm. wide, rounded or obtuse at the apex and there pulvinate or barbate, entire or slightly undulate, narrowly cuneate into the petiolule at the base, glabrous above and olivaceous-castaneous in drying, pubescent beneath and gray-brown when dry; secondaries about 10, plainly visible; inflorescence axillary, the cymes about 1.5 cm. long, 1.5--2 cm. wide, few-flowered, fulvous-sericeous; peduncles 1 cm. long or less; bracts linear or linear-oblong, about 4 mm. long, surpassing the pedicels, pubescent; pedicels 1--2 mm. long; calyx campanulate, about 3 mm. long, densely fulvous-sericeous, its teeth deltoid, scarcely 1 mm. long, shorter than the tube, acute or obtuse at the apex; corolla white, its tube about 6 mm. long, about 2.2 mm. wide at the base and 4.2 mm. wide at the apex, twice as long as the calyx-tube, incurved and somewhat ampliate above, externally pubescent, the posterior lobe abbreviated, ovate, about 2.5 mm. long, obtuse at the apex, the lateral ones very broadly ovate-oblong, about 4 mm. long, very obtuse, somewhat shorter than the anterior one, hardly 5 mm. long; upper stamens exserted about 2.5 mm. from the corolla-mouth; anthers about 0.8 mm. long, short-exserted, with subparallel thecae; style about 6.5 mm. long, glabrous; ovary attenuate and setose toward the apex, about 2.5 mm. long; fruiting-calyx and fruit not known.

The type of this species was collected by Charles Francis Massey Swynnerton (*no. 1054*) -- in whose honor it is named -- in the forests at Madanda, at an altitude of about 400 feet, Gazaland, Portuguese East Africa, flowering in December. It is said to be closely related to *V. welwitschii* Gürke, from which it may be distinguished easily by its differently shaped leaflets and longer petiolules.

VITEX TANGENSIS Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895.

Synonymy: *Vitex polyantha* J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 321. 1900.

Literature:Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 321--322. 1900; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 50, 68--69, & 84. 1928; Chiov., Fl. Somala 2: 365. 1932; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Alph. List Invalid Names 54. 1942;

Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50, 52, & 104 (1942) and [ed. 2], 117, 118, 121, & 203. 1949.

Illustrations: Chiov., Fl. Somala 2: 365. 1932.

Shrub or small tree, to 7 m. tall; branchlets short, short-pubescent with yellowish or drab hairs; leaves 3-foliolate; petioles slender, 2.5--5 cm. long; leaflets sessile when immature, distinctly petiolulate when mature; leaflet-blades moderately firm, oblong or oblong-lanceolate, 2.5--7.5 cm. long, acute or acuminate at the apex, entire, dark-green and glabrous above when mature, paler beneath, pubescent and dotted beneath; inflorescence cymose, axillary, very numerous, short-pedunculate, densely congested; pedicels very short, densely pubescent; bracts lanceolate; calyx campanulate, about 2 mm. long, densely yellowish-pubescent, its rim minutely toothed, the teeth broad, acute; corolla-tube about twice the length of the calyx when mature, very pubescent; stamens exserted; fruit globose, 2.5 cm. or more in diameter, glabrous.

The type of this species was collected by Georg Ludwig August Volkens (no. 92) at Tanga, Usambara, Tanganyika Territory, while that of V. polyantha was collected by Thomas Wakefield at Mombasa, Kenya. Pieper points out that Baker distinguishes his V. polyantha from V. tangensis only by its sessile leaflets, but his type collection bears only immature leaves, and the immature leaves of V. tangensis also exhibit sessile leaflets. He cites an additional Companhia de Moçambique 359 from Portuguese East Africa.

VITEX TELORAVINA J. G. Baker, Journ. Linn. Soc. Lond. Bot. 25: 340--341. 1890.

Synonymy: Vitex teleravina Baker apud Durand, Ind. Kew. Suppl. 1: 457, sphalm. 1906. Vitex telorovina Baker, in herb.

Literature: J. G. Baker, Journ. Linn. Soc. Lond. Bot. 25: 340-341. 1890; Durand, Ind. Kew. Suppl. 1: 457. 1906; Pieper in Engl. Bot. Jahrb. 62, Beibl. 141 ["142"]: 76, 79, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104. 1942; Moldenke, Alph. List Invalid Names Suppl. 1: 29. 1947; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123 & 203. 1949.

An erect shrub or tree, 10--15 m. tall; branches rather stout; branchlets and twigs medium-slender or slender, obtusely tetragonal, medullose, densely tomentose with ferruginous or pale-brown tomentum on the younger parts, glabrescent in age; nodes not annulate; principal internodes 1--3 cm. long, mostly abbreviated, elongated to 11 or more cm. on sprouts; leaf-scars rather large, sunken, not conspicuously prominent; leaves decussate-opposite, 3--5-foliolate, the central leaflet much more conspicuously petiolulate than the lateral ones, giving the 3-foliolate leaves a pinnately trifoliolate aspect; petioles rather stout, 5--8.5 cm. long, densely sordid-tomentose or canescent-tomentellous, flattened above; petiolules very unequal, the lateral ones 1--18 mm. long, the central one 7--30 mm. long, all densely sordid-tomentellous; leaflet-blades thick-chartaceous or subcoriaceous, gray-green on both surfaces, the lateral ones often very asymmetric at the base, the central ones mostly obovate, sometimes elliptic, 4.5—15 cm. long, 2--6 cm. wide, mostly rounded (rarely mucronulate) at the apex, entire, acute or cuneate-acuminate at the base, conspicuously bullate and rugulose above, rather densely but obscurely short-pubescent above, densely brown-tomentose beneath when young, brown-pubescent and resinous-granular beneath when mature; midrib slender, deeply impressed above, very prominent and densely brown-tomentose beneath; secondaries slender, 9—12 per side, rather close, deeply impressed above, sharply prominent beneath on mature leaves, ascending, rather straight, not arcuate, not anastomosing; veinlet reticulation very abundant, deeply impressed above, sharply prominent to the finest parts beneath on mature leaves; inflorescence axillary, loose, rather few-flowered or many-flowered, shorter than the subtending petioles; flowers not known; peduncles stoutish, 1.5—3 cm. long, densely fulvous-tomentellous; cyme-branches widely divergent in fruit, 9—15 mm. long, densely sordid-tomentellous; fruiting-pedicels stout, 4—10 mm. long, densely sordid-tomentellous; fruiting-calyx turbinate, 5--10 mm. long, 8--12 mm. wide, incrassate, densely fulvous-tomentellous, its rim shortly 5-dentate, the teeth deltoid, about 2 mm. long, broad at the base, erect or spreading or even reflexed, acute at the apex; fruit drupaceous, brown, subglobose, 7—12 mm. long and wide, wrinkled in drying, very shiny, closely invested at the base by the fruiting-calyx when mature or completely invested by it when immature.

The type of this species was collected by Richard Baron (no. 5384) in the northwestern part of central Madagascar. The species has been collected in fruit from March to May, growing at altitudes of 800—900 meters. Common names are "belohalika", "malainaretina", "tatoralahy", "teloravina", and "voandskia". It has been confused in the past by herbarium workers with V. lanigera Schau.

Citations: MADAGASCAR: d'Alleizette 164m (P); Baron 3381 (P), 5384 (K--type, N--photo of type, N—isotype, P—isotype, Z—photo of type), s.n. (K); Basse s.n. [28 mai 1931] (P); Herb. Jard. Bot. Tananarive 4985 (P); Humbert 14430 (P); G. W. Parker s.n.(K).

VITEX THOMASI DeWild., Contrib. Etud. Fl. Katanga Suppl. 2: 106--108. 1929.

Literature: DeWild., Contrib. Etud. Fl. Katanga Suppl. 2: 106-108. 1929; Hill, Ind. Kew. Suppl. 8: 249. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 86. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 203. 1949.

Shrub or tree, to 15 m. tall, with a dense crown; trunk 5--6 m. tall, 40--50 cm. in diameter; bark yellowish, more or less deeply fissured in rectangles; branches subtetragonal, ferruginous-tomentose or velutinous-hirsute on the younger parts, eventually glabrescent; buds globose, 7—10 mm. wide; leaves 5-foliolate, the central leaflet usually larger than the others; petioles 5--13 cm. long, more or less plainly canaliculate above, very hirsute; petiolules 2--4 mm. long, very velutinous; leaflet-blades coriaceous, obovate-lanceolate, 5.5--17 cm. long, 2--6 cm. wide, more or less acuminate or obtuse at the apex, entire, velutinous-pubescent above, especially on the veins, densely tomentose beneath; secondaries 8--12 per side, arising at an angle of about 45° from the midrib; inflorescence axillary, to 19 cm. wide, more or less branched, very many-flowered; cymes dichotomous, lax, many-flowered, the branches to 3 cm. long; peduncles 11--13.5 cm. long, densely velutinous or ferruginous-tomentose; bractlets velutinous or ferruginous-tomentose, the lower ones lanceolate and to 5 cm. long, with the limb to 8 mm. wide, the upper filiform, soon caducous; pedicels 1--7 mm. long, velutinous with divergent hairs; calyx campanulate, about 3 mm. long, velutinous or ferruginous-tomentose outside, its rim obscurely 5-toothed, the teeth triangular-acute or deltoid, about 1 mm. long, acute at the apex; corolla short-tubular, the tube about 2.5 mm. long, velutinous on the outside, the limb 5-lobed, the anterior lobe cuneate, about 3 mm. long and 2.5 mm. wide; fruiting-calyx accrescent, cupuliform, about 5 mm. long, 7--9 mm. wide, its rim plainly but not conspicuously 5-toothed, densely hirsute externally, glabrous within; fruit ovoid-elliptic, about 10 mm. long, 5--6 mm. wide, black, shiny, glabrous.

The species is based on Thomas 1324 from Kalonda, Belgian Congo, collected on August 20, 1923, and on Delevoy 337, collected in the forest at Benzee, at km. 136, Belgian Congo, on October 2, 1921. Vernacular names recorded by the collectors are "kishiamafu", "luseki", and "mufutu" -- the last-mentioned of these is applied to various, often totally different, species of the genus. The plant is said to be related to V. buchneri Gürke, differing from it particularly in the smaller size of the calyx. It is named in honor of René León Xavier Thomas, a Belgian forester and agriculturist.

VITEX THOMASI f. KASAIENSIS DeWild., Contrib. Etud. Fl. Katanga Suppl. 2: 108--109. 1929.

This form differs from the typical form of the species in having its leaflet-blades obovate-elliptic, abruptly acuminate at the apex (the acumen to 1 cm. long), shortly velutinous-scabrous above and ferruginous-tomentose beneath.

DeWildeman describes the plant as a tree 10--12 m. tall; branches cylindric or subtetragonal, brownish-velutinous when young, glabrous and grayish when mature; leaves 5-foliolate, the central leaflet usually larger than the others; petioles 2--10 cm. long, velutinous-hirsute, more or less plainly canaliculate above; petiolules 1--3 mm. long, velutinous; leaflet-blades obovate-elliptic, 0.9--11.5 cm. long, 0.5--6 cm. wide, more or less abruptly acuminate at the apex (the acumen to 1 cm. long), entire, cuneiform at the base and narrowed into the petiolule, shortly velutinous-scabrous above, velutinous or ferruginous-tomentose beneath, the hairs brownish, not very dense nor long; secondaries 11--14 per side; inflorescence axillary, more or less branched, loose, many-flowered; peduncles 10--14 cm. long, velutinous or ferruginous-tomentose; cyme-branches dichotomous, to 2 cm. long; lower bractlets lanceolate, to 3.5 cm. long and 7 mm. wide (the blade to 2 cm. long), velutinous or ferruginous-tomentose, borne on filiform stalks, the upper bractlets filiform; fruiting-calyx accrescent, sessile or pedicellate, 4--5 mm. long, velutinous or ferruginous-tomentose on the outside, its rim with 5 large triangular teeth not very conspicuous; fruit ovoid-ellipsoid, to 12 mm. long and 8 mm. wide.

The type of this form was collected by Edouard Piere Luja (no. 259) in the forest at Bene-Dibele, Kasai, Belgian Congo.

VITEX THONNERI DeWild., Étud. Fl. Bangala & Ubangi 246--248, pl. 12. 1911.

Literature: DeWild., Étud. Fl. Bangala & Ubangi 246--248, pl. 12. 1911; DeWild., Fl. Bas- & Moyen-Congo 467. 1912; Hill, Ind. Kew. Suppl. 6: 219. 1926; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 45, 59, & 84. 1928; DeWild., Pl. Bequaert. 5: 16. 1929; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 86. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 203. 1949.

Illustrations: DeWild., Étud. Fl. Bangala & Ubangi pl. 12. 1911.

Tree, to 5 m. tall; young branchlets more or less tetragonal, flattened, tomentose with spreading hairs, yellow-ferruginous; petioles to 13 cm. long, more or less compressed, ferruginous-tomentose, ciliate on the margins; leaves 5-foliolate; petiolules densely ferruginous-tomentose, 5--10 mm. long; leaflet-blades paler beneath, oboval or elliptic, cuneiform at the base, more or less abruptly acuminate at the apex (the acumen itself acute and apiculate), entire, densely pilose on the veins beneath, less so above; secondaries about 10 per side, the lateral ones more or less asymmetric at the base, 4--8.5 cm. long, 2.5--5 cm. wide, the central ones symmetric and about 13 cm. long and 7 cm. wide; inflorescence axillary, opposite, lax, to 15 cm. long; peduncles compressed, about 9 cm. long, dichotomous at the summit, bracteate; bracts linear, velutinous, to 7 mm. long; pedicels at the center of the dichotomy 5 mm. long, those elsewhere only 1 mm. long, densely velutinous like the branches; calyx 2--4 mm. long, 5-dentate, densely velutinous-ferruginous; corolla white or whitish-violet, 6--7 mm. long, 2-labiate, externally densely velutinous, the lip pale-violet.

The type of this species was collected by Franz Thonner (no. 263) -- in whose honor it is named -- at 450 meters altitude, Banayville, on the Ubangi, Belgian Congo, on March 8, 1909. The collector found the plant in shrubbery among rocks and says it was isolated and very rare. DeWildeman cites also Bequaert 6936 from the edge of river woods at Stanleyville, Belgian Congo, collected on February 18, 1915. Pieper cites also Malchair 73 from near Likimi, Bangala, Belgian Congo.

VITEX THONNERI var. TIBATENSIS (Engl.) Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 59. 1928.

Synonymy: Vitex tibatensis Engl. ex Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 59, in syn. 1928.

Literature: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 59 & 84. 1928; Moldenke, Alph. List Invalid Names 55. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 203. 1949.

This variety differs from the typical form of the species in being more densely pubescent, the leaf-margins being occasionally irregularly dentate, and the calyx-teeth sometimes as many as 7.

The type of the variety was collected by Carl Ludwig Ledermann (no. 2471) at Tibati, Cameroons, and is deposited in the herbarium of the Botanisches Museum at Berlin. It is known thus far only from the original collection.

VITEX THORELII Dop, Bull. Soc. Hist. Nat. Toulouse 57: 206--207. 1928.

Literature: Dop, Bull. Soc. Hist. Nat. Toulouse 57: 206--207. 1928; Hill, Ind. Kew. Suppl. 9: 298. 1938; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 59 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 86. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 137 & 203. 1949.

Shrub or tree; branchlets tetragonal, ferruginous-pubescent when young, later glabrescent; bark gray; leaves 3-foliolate; petioles slender, tetragonal, about 4 cm. long, ferruginous-pubescent; leaflet-blades chartaceous, brunnescent in drying, elliptic or elliptic-lanceolate, 8--9 cm. long, 1.5--3 cm. wide, entire, acuminate at the apex, acute or obtuse and often inequilateral at the base, glabrous above and scabrous except for the venation, glandulose, pubescent beneath; secondaries slender, 16 to 20, recurved; vein and veinlet reticulation conspicuous; central petiolules about 1.5 mm. long, the lateral ones subobsolete; inflorescence paniculate, terminal, pyramidal, lax, pubescent; peduncles elongate, opposite; cymules dichotomous, divaricate, 3-flowered; bracts firm, very small; pedicels 2--3 mm. long, 2-bracteolate at the apex; flowers about 8 mm. long; calyx campanulate, about 2.5 mm. long, slightly bilabiate, pubescent on the outside, the 5 lobes acute and about 1.5 mm. long, the 2 lower ones smaller; corolla very pubescent on the outside except for the base of the tube, the tube glabrous inside except at the insertion of the stamens and at the throat, about 4 mm. long, the upper lip 2-lobed with rounded lobes about 2 mm. long and glabrous inside, the lower lip 3-lobed, the middle lobe about 4 mm. long and villous at the base within; stamens not exserted; filaments villous at the base; anther thecae recurved; style equaling the stamens; stigma 2-lobed; ovary glabrous; fruiting-calyx 2-lipped; fruit drupaceous.

The type of this species was collected by Clovis Thorel (no. 2422) -- in whose honor it is named -- between 1866 and 1868 at Lacone, Cambodia, Indochina. No number is given by Dop in his original description, but it appears fairly certain that no. 2422 is the type collection, although it was misidentified and distributed as V. leptobotrys H. Hallier in at least the Stockholm herbarium. It is inscribed on its label "Expedition du Me-Kong. Lacone". The species is said by Dop to be characterized by the subbilabiate calyx, a character more noticeable at time of fruiting.

Citations: INDOCHINA: Cambodia: Thorel 2422 (F--photo of isotype, N--isotype, N--photo of isotype, S--isotype, Sg--photo of isotype, Z--photo of isotype).

VITEX THYRSIFLORA J. G. Baker, Kew Bull. 1895: 152. 1895.

Synonymy: Vitex staudtii Gürke in Engl., Bot. Jahrb. 33: 299--300. 1904. Vitex agraria A. Chev., Expl. Bot. Afr. Occid. Franc. 1: 505, hyponym. 1920.

Literature: J. G. Baker, Kew Bull. 1895: 152. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 319. 1900; Gürke in Engl., Bot. Jahrb. 33: 299--300. 1904; Sim, For. Fl. & Res. Port. East Afr. 94. 1909; A. Chev., Expl. Bot. Afr. Occid. Franç. 1: 505. 1920; Wheeler, Bull. Am. Mus. Nat. Hist. 45: 444--452 & 585, fig. 88. 1922; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 42, 54, 80, & 85, pl. 10. 1928; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 46--48, 52, & 104. 1942; Moldenke, Alph. List Invalid Names 52, 54, & 55. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 46 & 84. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 111--114, 121, & 203. 1949.

Illustrations: Wheeler, Bull. Am. Mus. Nat. Hist. 45: 449, fig. 88. 1922; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 10. 1928.

Much-branched shrub, tree to 4 m. tall, or liana; trunk to 10 cm. in diameter; branchlets glabrous, usually with an ant-home entrance at each node, sometimes a second hole in the internode; leaves 5-foliolate, long-petiolate; leaflets distinctly petiolulate, the blades submembranous, obovate-oblong, cuspidate at the apex, green and glabrous on the upper surface, pale and slightly pubescent beneath, the central one 15--20 cm. long and 7.5--9 mm. wide at the middle; inflorescence terminal, paniculate, ample, thrysoid; pedicels short, pubescent; bractlets small, linear; calyx campanulate, about 3 mm. long, its rim dentate, the teeth small, deltoid; corolla white or whitish, its tube twice the length of the calyx, the lobes oblong, the upper ones dirty-yellow, the lower ones violet; stamens included; fruit hard, dry, pale orange-yellow.

The species is based on Harrison 5 from Abeokuta, western Lagos, and on Rowland s.n. from the interior of Southern Nigeria, collected in 1863. The type of V. staudtii was collected by Georg August Zenker and Alois Staudt -- in whose honor it is named -- their collection no. 18, from an open forest at Yaúnde Station, Cameroons. Chevalier's V. agraria, is based, without formal description, on several of his collections from French

Guinea (nos. 13199 and 13267), Ivory Coast (nos. 17055, 17140, 19340, and 19805), and Southern Nigeria (no. 14122). Pieper gives V. myrmecophila Mildbr. in the synonymy of this species, but he cites the numbers which Mildbraed's species is based upon under var. laxiflora, so the name actually belongs in the synonymy of that variety.

Gürke was acquainted with Baker's V. thyrsiflora only from the description when he proposed his V. staudtii. The characters which he gives as distinguishing the two do not hold. The character of myrmecophily which he emphasizes for V. staudtii is also very noteworthy in V. thyrsiflora, although it was not mentioned by Baker in his original diagnosis. Gürke appears actually to have based his species on Baumann 564, "not uncommon in high forest", Togo, May 1895, Zenker 1412a from Yaúnde Station, Zenker & Staudt 18, in open jungle on an old plantation at Yaúnde Station, altitude 800 meters, September 1893, and Zenker & Staudt 355, from sunny open places on laterite at Yaúnde Station, May 1895.

According to Wheeler the ants involved in the myrmecophily of this species is Viticicola tessmanni (Stitz). It is a very vicious species, and very alert. If the host plant is disturbed ever so slightly, the ants rush out of the hollow stems in great numbers and explore the entire plant. Their sting is extremely painful, sometimes causing vesicles to rise on the skin.

It is worthy of note that Pieper cites for V. thyrsiflora the following collections: Baumann 564 from Togo, Harrison 5 and Rowland s.n. from Southern Nigeria, Zenker 1412a and Zenker & Staudt 18 from Cameroons, and Sim 6046 from Zambezia, Portuguese East Africa.

The species inhabits forests along riverbanks, high forests, open jungles, and sunny open places on laterite, blooming in April, May, and July. It has been collected in fruit in January and June. A common name is "ngunge-di". Specimens have been misidentified as Scrophulariaceae in some herbaria. The leaves are boiled and used in native medicines to alleviate the pains of ulcers. It has been found growing at an altitude of 165 to 800 meters.

Citations: SIERRA LEONE: N. W. Thomas 1164 (Br, N). BELGIAN CONGO: Bequaert 2216 (Br, Br); Bredo 6 bis (Br), 1178 (Br), 1184 (Br); De Graer 866 (Br); De Wulf 11 (Br); Lebrun 2575 (Br, Br, N), 2911 (Br, Br, N--photo, Z--photo); Pittery 28 (Br, Br); Steyaert 587 (Br), 604 (Br).

VITEX THYRSIFLORA var. LAXIFLORA Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 54 & 85. 1928.

Synonymy: Vitex myrmecophila Mildbr., Wiss. Ergebn. Deutsch. Zentral-Afr. Exped. 1910/11, 2: 34 & 80, hyponym. 1922.

Literature: Mildbr., Wiss. Ergebn. Deutsch. Zentral-Afr. Exped. 1910/11, 2: 34 & 80. 1922; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 54 & 85. 1928; Moldenke, Alph. List Invalid

Names 54. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 203. 1949.

This variety differs from the typical form of the species only in its more lax inflorescences.

The variety is based on three collections from Cameroons, all deposited in the herbarium of the Botanisches Museum at Berlin: Zenker & Staudt 355, from sunny open places on laterite at Yaúnde Station, May 1895, Mildbraed 3896 from Molundu on the Dscha (Ngoko), and Mildbraed 5097 from between Assobam on the Bumba and Lomie Station, in the south Cameroons forest region. The last two of these were cited by Mildbraed in his original publication of V. myrmecophila, but without description to validate the name. He merely stated that the twigs are inhabited by ants. Pieper places the binomial in the synonymy of the typical form of V. thyrsiflora, but cites both cotype collections as cotypes of his var. laxiflora, so Mildbraed's binomial obviously belongs in the synonymy of the variety. Zenker & Staudt 355 is one of the collections on which Gürke based his V. staudtii.

VITEX TOMENTULOSA Moldenke, Bull. Torrey Bot. Club 60: 58—59. 1932.

Literature: Moldenke, Bull. Torrey Bot. Club 60: 58--59. 1932; Moldenke, Geogr. Distrib. Avicenn. 6. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 25 & 104 (1942) and [ed. 2], 45 & 203. 1949; Roig, Dicc. Bot. 2: 1115. 1953; Alain in León & Alain, Fl. Cuba 4: 317--318. 1957.

Shrub or tree; branches and branchlets slender, obtusely tetragonal or subterete, grayish, more or less pulverulent-puberulent with cinereous or flavescent puberulence on the younger parts and nodes, becoming glabrate in age; twigs short, slender, obtusely tetragonal or subterete, densely pulverulent-puberulent with decidedly flavescent puberulence; nodes obscurely or not at all annulate; principal internodes mostly much abbreviated, 2--10 mm. long; leaf-scars very small, usually not at all prominent, inconspicuous; leaves decussate-opposite, 3-foliolate; petioles very slender, 1.5--3.2 cm. long, convex beneath, flattened and canaliculate above, densely tomentulose with very short sordid or flavescent hairs or densely cinereous-puberulent, not noticeably ampliate at the base nor disciform at the apex; leaflets subequal or the 2 lateral ones somewhat smaller, all subsessile or short-petiolulate on canescent-puberulent, canaliculate, and margined petiolules 1--2 mm. long, the central petiolule usually longer than the lateral ones; leaflet-blades firmly chartaceous or subcoriaceous, very dark-green above, whitish or flavescent beneath, the central one narrowly elliptic or oblanceolate, 1.5—6 cm. long, 5--11 mm. wide, sharply acute or attenuate-acuminate (rarely emarginate) at the apex, entire and with the margins occasionally subrevolute, acute or subcuneate at the base, densely pulverulent and often granular above, densely tomentulose with matted and cinereous or sordid to flavescent tomentum beneath; midrib very slender, impressed above, prominent beneath; secondaries slender, very short, 8--15 per side, ascending, rather straight except at the margins where they are rather conspicuously arcuate-joined, obscure or subimpressed above, very prominent beneath; vein and veinlet reticulation comparatively abundant, obscure or subimpressed above, prominulent beneath; inflorescence axillary, cymose or subpaniculate, 2--3 cm. long, 1--2 cm. wide, composed usually of one pair of rather long-stipitate lateral cymes and a terminal one, each cyme 3--7-flowered; peduncles very slender, 1--1.5 cm. long, densely puberulent like the petioles; rachis and inflorescence-branches approximately equal in length, 3--7 mm. long, densely puberulent like the peduncles; pedicels obsolete or to 1 mm. long and densely puberulent; calyx obconic-campanulate, about 2.8 mm. long and 2.6 mm. wide, somewhat 4- or 5-angled, its rim subtruncate, scarcely or very slightly 4- or 5-toothed on the angles, very densely granulose-pulverulent; corolla infundibular or hypocrateriform, its tube broadly cylindric, about 2.3 mm. long, very much ampliate above, more or less densely pilose within, its limb 4-parted, slightly irregular, its lobes broadly oblong-lingulate, 1--1.3 mm. long and wide, very broadly rounded at the apex, puberulent, slightly granulose-pulverulent on the back; stamens 4, inserted near the mouth of the corolla-tube; filaments filiform, about 1.3 mm. long, pilose; anthers oblong, about 0.6 mm. long and 0.3 mm. wide; style capillary, 2--3 mm. long, glabrous; stigma bifid, its branches about 0.5 mm. long, erect, somewhat divergent; ovary subglobose, about 0.7 mm. long and wide, somewhat tetragonal, granulose-pulverulent at the tip; fruit black.

The type of this species was collected by Alberto Fors y Reyes (*Roig 5831*) at Los Fagales, Las Martinas, Rematu de Guane, Pinar del Río, Cuba, on March 25, 1929, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species inhabits limestone terraces facing the sea, and has been collected in fruit in January. Fors reports that the wood is useful and that a common name is "roble guiro", "robleguiro", or "roble güiro". It has been confused in the past by herbarium workers with *V. clementis* Britton & P. Wils.

Citations: CUBA: Oriente: *Bucher s.n.* [León 18552] (Ha); *Ekman 16170* (B, E--photo, N, N, N--photo, S, S, Z--photo); *León 16336* (Ha, N); *Sagra 229 & 909* (N). Pinar del Río: *Acuña 19936* (Z); *Fors s.n.* [*Roig 5831*] (Es--isotype, N--type).

VITEX TRICHANTHA J. G. Baker, Journ. Linn. Soc. Lond. Bot. 21: 434--435. 1885.

Synonymy: *Chrysomallum trichantha* Baker, in herb. *Rhamnotiphus ferrugineus* Baker, in herb.

Literature: J. G. Baker, Journ. Linn. Soc. Lond. Bot. 21: 434-435. 1885; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 76, 79, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104 (1942) and [ed. 2], 123 & 203. 1949; Moldenke in Humbert, Fl. Madag. 174:120--122. 1956.

Illustrations: Moldenke in Humbert, Fl. Madag. 174: fig. 18, 4--6. 1956.

A much-branched erect shrub; branches, branchlets, and twigs very slender, obtusely tetragonal, grayish-brown, densely fulvous villous on the younger parts with long spreading or slightly antrorse hairs, glabrescent in age; nodes not annulate; principal internodes abbreviated, 5--25 mm. long; leaves decussate-opposite and 1-foliolate; petioles slender, 5--14 mm. long or sometimes more abbreviated, very densely fulvous-villous with long spreading hairs; leaf-blades chartaceous (not subcoriaceous as stated by Baker), firm-textured, rather uniformly bright-green on both surfaces, oblong or elliptic, 4--12 cm. long, 2--5 cm. wide, acute or slightly mucronate at the apex, entire or irregularly short-dentate near the middle, often slightly subrevolute along the margins, rounded at the base, villous on both surfaces when young, glabrescent above and loosely villous beneath when mature, more densely villous on the larger venation; inflorescence axillary, 1- or 2-flowered, shorter than the subtending leaves; peduncles very slender or filiform, 5--15 mm. long, very densely fulvous-villous; bractlets lanceolate, 3--5 mm. long, more than twice as long as wide, densely spreading-villous with fulvous hairs on both surfaces, attenuate at the apex; pedicels filiform and to 10 mm. long and densely fulvous-villous, or obsolete; calyx campanulate, 7--8 mm. long, densely shaggy-villous with fulvous hairs, the rim 5-lobed, the lobes lanceolate, about as long as the tube; corolla purple or red, cylindric, incurved, or infundibular-elongate, 2--2.5 cm. long, 5--6 mm. wide at the apex, densely fulvous-villous with long spreading or subappressed hairs on the outside, the lobes small, orbicular; stamens and style exserted beyond the corolla-lobes; anthers minute, globose; stigma bifid; ovary densely hairy; fruiting-calyx and fruit not known.

The type of this species was collected by Richard Baron (*no. 2316*) in central Madagascar, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. The species inhabits forests, at altitudes of 1000--1400 meters, flowering in November.

Citations: MADAGASCAR: *Baron* *2316* (K--type, N--isotype, N--photo of type, P--isotype, Z--photo of type); *Catat* *1758* (P); *Decary* *5080* (P), *5082* (P); *Humbert* *3518* (P).

VITEX TRIFLORA Vahl, Eclog. Amer. 2: 49. 1798.

Synonymy: *Pyrostoma* *ternata* G. F. W. Mey., Prim. Fl. Esseq. 220. 1818. *Vitex* *ferruginea* Vahl ex H.B.K., Nov. Gen. & Sp. Pl. 2: 246 [ed. pict. 200]. 1818 [not *V. ferruginea* Schum. & Thonn., 1827, nor Bojer, 1847, nor Baker, 1928, nor H. & B., 1955, nor Schum., 1955]. *Casarettoa* *diversifolia* Walp., Repert. 4: 92. 1844. *Ruellia* *macrocalyx* Ruíz ex Nees in A. DC., Prodr. 11: 218, in syn. 1847. *Macrostegia* *ruiziana* Nees in A. DC., Prodr. 11: 218, in syn. 1847. *Vitex* *triflora* var. *tenuifolia* Huber, Bol. Mus. Goeldi 5: 214--215. 1909. *Clerodendrum* *ternatum* Hoffmgg. ex Moldenke, Prelim. Alph. List Invalid Names 23, in syn. 1940 [not *C. ternatum* Schinz, 1890]. *Pyrostoma latifolia* G. F. W. Mey. ex Moldenke, Prelim. Alph. List Invalid Names 39, in syn. 1940. *Pyrostoma 3-foliolata* G. F. W. Mey. ex Moldenke, Prelim. Alph. List Invalid Names 39, in syn. 1940. *Vitex paraensis* Mart. (in part) ex Moldenke, Prelim. Alph. List Invalid Names 51, in syn. 1940 [not *V. paraensis* Moldenke, 1940]. *Vitex sericea* Poepp. (in part) ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940. *Vitex triphylla* Vahl ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940 [not *V. triphylla* Royle, 1839, nor L., 1947]. *Vitex trifolia* Vahl ex Moldenke, Suppl. List Invalid Names 11, in syn. 1941 [not *V. trifolia* L., 1781, nor Moon, 1895, nor L. f., 1933, nor Sessé & Moc., 1940, nor Hemsl., 1949]. *Calymega trifoliata* Poit., in herb. *Pyrostoma trifoliata* Mey., in herb. *Pseudobasleria* Von Rohr, in herb. *Vitex argentea* Hort., in herb. *Vitex triflora* Schau., in herb.

Literature: L., Suppl. Pl. 293. 1781; Vahl, Eclog. Amer. 2: 49. 1798; G. F. W. Mey., Prim. Fl. Esseq. 220. 1818; H.B.K., Nov. Gen. & Sp. Pl. 2: 246 [ed. pict. 200]. 1818; Schum. & Thonn. in Schum., Beskr. Guin. Pl. 288--289. 1827; Royle, Illustr. Bot. Himal. 299. 1839; Walp., Repert. 4: 92. 1844; Nees in A. DC., Prodr. 11: 218. 1847; Schau. in A. DC., Prodr. 11: 694. 1847; Schau. in Mart., Fl. Bras. 9: 300--302 & 307, pl. 49. 1851; Ettingsh., Blatt-Skelet. Dikot. 79, pl. 32, fig. 6. 1861; Ettingsh., K. Akad. Wiss. Wien Denkschr. 28: 219 [Fossile Flora Bilin 2: 32]. 1868; Schinz, Verhandl. Bot. Ver. Brand. 31: 206. 1890; Huber, Bol. Mus. Goeldi 5: 212--215, pl. 1. 1909; Glaz., Bull. Soc. Bot. France Mém. 3: 547. 1911; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 91, pl. 11, fig. 3. 1928; Stapf, Ind. Lond. 6: 479. 1931; LeCointe, A Amaz. Brasil. III Arv. & Pl. Uteis 430. 1934; Moldenke, Alph. List Common Names 20 & 29. 1939; Moldenke, Geogr. Distrib. Avicenn. 21, 22, 24, 27, & 28. 1939; Moldenke, Prelim. Alph. List Invalid Names 14, 23, 32, 39, 51, & 52. 1940; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Suppl. List Invalid Names 11. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 33, 35, 39, 40, & 104. 1942; Moldenke, Alph. List Invalid Names 12, 21, 33, 39, 54, & 55. 1942; Moldenke, Phytologia 2: 122. 1944; LeCointe, O Est. do Para 292. 1945; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 65, 67--69, 74, 95, 98, & 203. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Angely, Gazeta do Povo, Curitiba, 37, no. 10698, p. 5. Dec. 8, 1955.

Illustrations: Schau. in Mart., Fl. Bras. 9: pl. 49. 1851; Ettingsh., Blatt-Skelet. Dikot. 79, pl. 32, fig. 6. 1861; Huber, Bol. Mus. Goeldi [Mus. Para.] 5: pl. 1. 1909; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 11, fig. 3. 1928.

Shrub or small tree, to 13 m. tall: trunk to 20 cm. in diameter at breast height; branches rather stout, obtusely tetragonal or subterete, gray, medullose, glabrate, not plainly lenticellate; branchlets more slender, more acutely tetragonal, often brownish or purplish in drying, glabrate; twigs slender, often flattened and sulcate in drying, more or less puberulent (especially at the nodes) with brownish or flavescent and very minute hairs; nodes not annulate; principal internodes 1—9 cm. long (or sometimes elongate to 17 cm. on older wood); leaf-scars large, slightly elevated on older wood; buds obconic, hairy with golden-brown hairs; leaves decussate-opposite, 3-foliolate; petioles slender, 1.2—6 cm. long, densely or sparsely puberulent with appressed flavescent hairs or becoming glabrous, not noticeably ampliate at the base, convex beneath, flattened and canaliculate above; leaflets subequal in size or the 2 lateral ones slightly smaller, all very shortly petiolulate or subsessile; petiolules 1—3 mm. long and sparsely strigillose-puberulent, mostly margined; leaflet-blades thin-chartaceous or papery, rather uniformly light-green on both surfaces, the central one elliptic or subobovate, 5.5--22 cm. long, 2.4—9.4 cm. wide, acute or short-acuminate (rarely obtuse) at the apex, entire, acute or acuminate at the base, glabrous or subglabrate above (except for the pilose midrib), more or less puberulent or flavescent-pilose along the midrib and larger venation (or glabrous) beneath, the lateral ones similar in all respects but sometimes slightly smaller; midrib slender, flat or subimpressed above and usually more or less pilose, prominent beneath; secondaries slender, 8--15 per side, arcuate-ascending, arcuately joined near the margins, flat or subimpressed above, prominulent beneath; vein and veinlet reticulation fine, subprominulent on both surfaces; inflorescence axillary, cymose, usually 3-flowered or bifurcate and 7-flowered, rarely 1-flowered, 3.5 to 11 cm. long, 1--3 cm. wide; peduncles very slender, 1.5--7.5 cm. long, densely or sparsely puberulent, flattened; pedicels slender, 1--7 mm. long, puberulent with incanous or flavescent hairs; bracts none; bractlets and prophylla linear, 2--4 mm. long (or rarely elongate to 2.5 cm. and 3 mm. wide); calyx papery, tubular-infundibular, green, to 2 cm. long, 2-lipped, deeply 5-fid, rather densely appressed-pubescent with flavescent hairs, the lobes foliaceous, lanceolate, sharply acute, often spreading or recurved, more sparsely appressed-puberulent; corolla hypocrateriform or personate, varying from blue, pale-blue, or sky-blue to pale-purple, purple, pale-lavender, lilac, or violet, the upper lip lighter, the larger lobe darker or purple, its tube cylindric, incrassate, palest-lilac, to 2.3 cm. long, very densely appressed-villous with flavescent antrorse hairs on the portion exserted from the calyx-tube, its limb 2-lipped, lilac-purple, 5-lobed, the lobes comparatively small, densely villous like the tube externally, glabrous within, the upper lip erect and bifid, the lower lip with the middle lobe rounded at the apex, crenulate, barbulate on the ywllowish eye-spot at the base, and deepest purple; stamens slightly exserted, barbate at the base; filaments bluish; style subequaling the stamens; stigma very shortly bifid; ovary oblong, more or less tomentose; fruiting-calyx accrescent, its lobes often much enlarged and very foliaceous; fruit drupaceous, gray, fleshy or dry, about 1.5 cm. long and 1 cm. wide, densely appressed-pubescent with cinereous or flavescent hairs, edible, the thin mesocarp smelling strongly of Eau de Cologne, especially in drying, turning purplish, 4-celled, 1 or more seeds often aborted.

The type of this widespread and well-known species is a specimen from the Vahl herbarium [*Herb. Willdenow 11701*; Macbride photos 22779] inscribed "Ex India" on the label. The type of *Macrostegia ruiziana* and of *Ruellia macrocalyx* was collected by *Hipólito Ruíz* [Macbride photos 5885] in Peru.

The species grows from Amazonian Venezuela, British Guiana, Surinam, and French Guiana, through Amazonian Brazil, to Peru and Bolivia. It has been cultivated in Brazil and France. One specimen in the Brussels herbarium is inscribed "Insulae Bahamenses", but whether this Amazonian tree is or was actually cultivated in the Bahamas is doubtful. The *Vitex ferruginea* accredited to Vahl by Kunth is probably *V. triflora*. Vahl described only *V. capitata* and *V. triflora*. Ettingshausen refers to this species as "*V. sericea* of Chile", but it is not known from that country.

Spruce reports that the entire tree is aromatic in every part. It inhabits terra firma, mata virgem, campos, forests, thickets, lowlands, swamps, and streamsides, from 70 to 300 meters altitude. Cowan reports it as infrequent in lowland forests. It has been collected in anthesis from March to December, and in fruit from September to December and in February. A Poiteau specimen from French Guiana in the Delessert Herbarium at Geneva is remarkable in having the leaflets glabrous on both surfaces and very shiny, and the *Leprieur 266*, also from French Guiana, in the Delessert and Leiden herbaria agrees with it in these respects, although it has much smaller leaflets, but a duplicate at Kew shows the usual puberulence on the lower leaf-surface. The Delessert Herbarium specimen of *Poeppig 2555b* is inscribed, apparently erroneously, "Perou". A wood sample of *Ginzberger 818* is deposited in the Chicago Natural History Museum. Glaziou, in the reference cited above, lists a no. "15165a", but this seems to be a typocraphic error for no. 14165a.

The species is called "mama cachorra", "mama de cachoira", "tarumã", "tarumá", and "tarumá de terrafirma" in Brazil, "tahuari" in Peru, "pantà" in Surinam, "guaratario" in Venezuela, and "hakiaballi" in British Guiana. It has been confused in herbaria with *V. gigantea* H.B.K., *V. trifoliolata* Lam., *Hosta odorata* Poepp., *Clerodendrum ternifolium* H.B.K., and the genus *Duranta* L. Specimens have also been misidentified as *Petrea* Houst. and even *Ruellia* L. LeCointe, in his 1934 publication cited above, lists the common names "tarumà de matta" and "tarumá silvestre". In his 1945 work he gives the name "tarumá da matta" and says that the leaves are used in the treatment of cystitis and urethritis, the root as a tonic and febrifuge, and the fruit as an emmenagogue and diuretic. Schauer, in his 1851 work, states that the name "taruma" is used for the tree throughout Pará and the Rio Negro region. Actually that name, in one or another of its variant spellings, is applied to most species of *Vitex* in the Amazonian area; "hakiaballi" is also applied to *V. guianensis* Moldenke.

Citations: VENEZUELA: Amazonas: *Ll. Williams 15688* (W--

1376360). BRITISH GUIANA: A. Anderson s.n. (K); De la Cruz 3554 (Ca--299211, E--917737, G, K, N, W--1282788); N. G. L. Guppy 222 [Herb. Forest Dept. Br. Guian. 7198] (K); Herb. Forest Dept. Br. Guian. 4028 [F.1292] (N); Herb. Rudge s.n. (S); ImThurn s.n. [Oct. '79] (K, P); Jenman 476 (P, U), 2036 (C, U); W. H. F. Talbot s.n. [1840] (K). SURINAM: Hulk 235 (Ut); Kappler 67 (Le), 2093 (B, Gt, Le, V, V), s.n. [1861] (Ut), s.n. [1862] (Ut); B. Maguire 24837 (N, S); Tresling 379 (Ut). FRENCH GUIANA: Collector undesignated 352 (P, P, Us), s.n. [Cayenne] (Dc, Dc, Dc, Dc, Dc, Dc, Le), s.n. (Dc); Cowan 38829 (S); DeCandolle & L'Héritier s.n. (Cb, Cb); Gabriel s.n. (Cb, Cb, Cb, F--870960); Herb. Barbier s.n. (P); Herb. Harvey s.n. [Cayenne, 1842] (Du--166533); Leprieur 266 (Cb, Le, P), s.n. [1838] (P), s.n. [1839] (Cb, Cb); J. Martin s.n. [Herb. Rudge] (Bm, Bm), s.n. (Bm, Bm, Bm, Bm, Br, K); Perrottet s.n. [1821] (P), s.n. (Cb, Cb, N); Poiteau s.n. (B, B, Cb, Cb, K, P, P, P, P); Rech 17 (P); L. C. Richard s.n. (P, P, P); Ryan s.n. [Cayenne] (Cp); Sagot s.n. [Karouany, 1857] (P), s.n. [Karouany, 1859] (V). PERU: Loreto: Ducke 7561 (Cb); Klug 1254 (F--627556, N, W--1456261), 1492 (F--627495, N, W--1456410), 2791, in part (B, F--690207, S); Poeppig 2362, in part (Cb, F--876715, P, P, V, V, V, V, X), s.n. (Le); Ll. Williams 4195 (F--627017, N). Department undetermined: Ruíz s.n. [Macbride photos 5885] (N--photo); Ruíz & Pavon s.n. (F--843612). BRAZIL: Amapá: Cowan 38398 (N); Fróes 26651 (N). Amazonas: Ducke 6759 (Cb); Fróes 22495 (Be--32283, N); Krukoff 4704 (A, B, B, Ca--606320, Cb, F--810958, It, K, N, S, Sp--35046, Ug, Ut), 6034 (F--874477, Mi, N, S), 6869 (F-874070, Mi, N, S); Murça Pires 105 (Be--19996, N); Poeppig 2555b (B, Cb, Cb, P, V), s.n. [prope Ega] (B, Bm, V); Schwacke 3636 (Cb); Spruce 2130 (B, B, Bm, Br, Cb, Cb, Ed, G, K, K, Lu, N, P, V, V, X). Maranhão: Fróes 13 (W--1617858), 1972 (A, B, Bm, Cb, E-1042170, K, Mi, N, P, S, Ut). Pará: Black 47-1794 (Be--30003, N), 48-3223 (Be--37758); Derby s.n. [near Santarem, 1871] (C); Ducke 1980 (Cb), 2950b (Bm, Cb, Cb, P, W--1040309); Fróes 20381 (Be--15917, N), 30403 (Z); Ginzberger 818 (F--934795), 819 (F--934797); Goeldi 7786 (Cb, Cb); Killip & Smith 30598 (F--929265, N); Martius 2590 (Br); A. M. Moss s.n. [1926] (Bm); Murça Pires & Black 416 (Ca--743872); Murça Pires, Fróes, & Silva 5966 (Z); A. J. de Sampaio 5014 [Herb. Mus. Nac. Rio de Janeiro 18917] (B); Schomburgk 227 (K); Sieber s.n. [Hoffmannsegg; Rio Negro] (Br); Spruce s.n. [prope Santarem, August 1850] (B, Cb, Cp, F--876587, G, P, X); Zerny 817 (F--935097). State undetermined: L. Riedel 1259 (N). BOLIVIA: El Beni: H. H. Rusby 1027 (C, D, F--162471, G, Pa, Pr, W--58261). CULTIVATED: Brazil: Glaziou 14165a (K, P). France: Hort. Celsianus s.n. (Cb); Hort. Paris s.n. (Cb, Cb, Cb, Cb). LOCALITY OF COLLECTION UNDETERMINED: Herb. Expos. Coloniale s.n.

(P); Herb. Vahl s.n. [Ex India; Macbride photos 22779] (B--photo of type, F--687354--photo of type, Kr--photo of type, N--photo of type); Moll s.n. [1834; Insulae Bahamenses] (Br); Von Rohr s.n. (Cp). MOUNTED ILLUSTRATIONS: Martius, Fl. Bras. 9: pl. 49. 1851 (B).

VITEX TRIFLORA var. ANGUSTILOBA Huber, Bol. Mus. Goeldi 5: 215, pl. 3, figs. 14--18. 1909.

Literature: Huber, Bol. Mus. Goeldi [Mus. Para] 5: 215, pl. 3, figs. 14--18. 1909; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104 (1942) and [ed. 2], 95 & 203. 1949.

Illustrations: Huber, Bol. Mus. Goeldi 5: 215, pl. 3, figs. 14--18. 1909.

This variety differs from the typical form of the species in its leaflets being membranous in texture, glabrous above and ferrugineous-puberulent on the veins beneath or else puberulent or short-pubescent throughout on both surfaces, the inflorescences rather lax and rather many-flowered, the calyx decidedly irregular and usually 2-lipped, its tube narrow-cylindric, the attenuate lobes shorter than the tube, narrowly lanceolate-triangular, and very acute at the apex.

The variety was based by Huber on his no. 254, collected in the Matta de Jupatitube, Belém, in July, 1896, and no. 524 from Marco da Legua, Belém, Pará, Brazil, collected in November, 1896, and Siqueira 6886 (in part) from the matta at São Salvador, Marajo Island, Brazil, collected in November, 1904. He comments that "Esta variedade, que se distingue principalmente pelo calyce bastante delgado dividido em lobulos muito estreitos e pontudos, tem-se achado ate aqui so na regiao costeira." The variety is said to inhabit forests and clearings and has been collected in anthesis in July and November.

A key for distinguishing this and the other varieties of V. triflora from the typical form of the species follows:

1. Leaflets thin-chartaceous or membranous.
  2. Leaves uniformly 3-foliolate.
    3. Leaflets distinctly downy above to touch; cymes usually more than 3-flowered.........V. triflora var. angustiloba.
    3a. Leaflets glabrous, subglabrate, or only obscurely strigillose above; cymes mostly 3-flowered..........V. triflora.
  2a. Leaves 3--5-foliolate....V. triflora var. quinquefoliolata.
1a. Leaflets thicker in texture, usually subcoriaceous or coriaceous.
  4. Cymes mostly many-flowered; calyx-tube as long as the lobes.
    5. Leaves 1--5-foliolate; leaflets usually very densely velutinous-tomentose on both surfaces; calyx densely hirsute-tomentose.......................V. triflora var. kraatzii.
    5a. Leaves 3-foliolate; leaflets only puberulent or softly short-pubescent on both surfaces; calyx appressed-pubescent ....V. triflora var. floribunda.

4a. Cymes few-flowered; calyx-tube often twice as long as the lobes............................V. triflora var. coriacea.

Citations: BRAZIL: Pará: Huber 254 (Bm--cotype, Cb--cotype, Cb --cotype, N--cotype, N--photo of cotype, Z--photo of cotype). MARAJO ISLAND: Siqueira 6886, in part (Cb--cotype).

VITEX TRIFLORA var. CORIACEA Huber, Bol. Mus. Goeldi 5: 215--216, pl. 1, figs. 1--4. 1909.

Literature: Huber, Bol. Mus. Goeldi [Mus. Para.] 5: 215--216, pl. 1, figs. 1--4. 1909; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Alph. List Common Names 29. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Phytologia 2: 122. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 203. 1949.

Illustrations: Huber, Bol. Mus. Goeldi [Mus. Para.] 5: pl. 1, figs. 1--4. 1909.

This variety differs from the typical form of the species in its leaflets being coriaceous or subcoriaceous in texture, and densely and softly velutinous-pubescent throughout on both surfaces. The inflorescence is contracted and the calyx-tube is elongate-cylindric, often twice as long as the very narrow lobes.

The type of the variety was collected by Adolfo Ducke (no. 1997) on the road from Belém to Pinheiro, Pará, Brazil, on December 31, 1900. Huber notes that "Pelos flores, esta especie approxima-se principalmente da variedade angustiloba, mas ella distingue-se pelas folhas coriaceas o mais avelludadas". It has been collected in anthesis in June, August, November, and December. The Herb. Rio de Janeiro 35668 specimen cited below is described as a small tree with blue-violet flowers. Its leaves are apparently immature amd are thin-membranous, but a single loose mature leaflet is decidedly coriaceous. It is, however, not at all certain that this loose leaflet actually belongs with the rest of the specimen. If it doesn't, then this collection may not represent this variety, but may be V. triflora in its typical form. Ducke records the common name "tarumá" for this collection. Silva describes the plant from which his collection, cited below, was taken as a large tree. The variety has been collected in secondary non-inundated forests and along roadsides.

Citations: BRAZIL: Amazonas: Ducke s.n. [Manáos, June 1937; Herb. Rio de Janeiro 35668] (N). Pará: Ducke 1997 (Cb--isotype, E--photo of isotype, N--photo of isotype, Z--photo of isotype); A. M. Moss s.n. [1916] (Bm, Bm), s.n. [1926] (Bm); Murça Pires & Black 126 (Be--17088); M. B. da Silva 155 (Be--13631).

VITEX TRIFLORA var. FLORIBUNDA Huber, Bol. Mus. Goeldi 5: 215, pl. 2, figs. 9--11, & pl. 3, fig. 21. 1909.

Synonymy: Vitex paraensis Mart. (in part) ex Moldenke, Prelim. Alph. List Invalid Names 51, in syn. 1940.

Literature: Huber, Bol. Mus. Goeldi [Mus. Para.] 5: 215, pl. 2, figs. 9--11, & pl. 3, fig. 21. 1909; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Prelim. Alph. List Invalid Names 51. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Alph. List Invalid Names 54. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 203. 1949.

Illustrations: Huber, Bol. Mus. Goeldi [Mus. Para.] 5: pl. 2, figs. 9--11, & pl. 3, fig. 21. 1909.

This variety differs from the typical form of the species in its leaflet-blades being subcoriaceous and more or less puberulent or softly short-pubescent on both surfaces, its inflorescences many- and densely flowered, the calyx-tube campanulate, shorter than in var. angustiloba, the lobes ovate-lanceolate or narrowly triangular, equaling the tube, rather obtuse or shortly acute at the apex, and the corolla showy, twice as long as the calyx.

The type of the variety was collected by Manoel Guedes (no. 2133) in the matta of the Bosque Municipal at Belém, Pará, Brazil, on July 20, 1901. Huber notes that "Se approxima da variedade precedente [var. angustiloba], com a qual cresce junto". It has been collected in anthesis from May to August and in October, and in fruit in July. The amount of pubescence on the leaflets varies greatly, but the blades are mostly ciliate along the margins. The corolla is described as light-blue, bluish, or violet. The variety is said to be a small tree or shrub, 3 m. tall, inhabiting woods on terra firma. The Ule collection cited below is anomalous in its few-flowered cymes and very sparsely puberulent leaflet-blades -- it may actually represent a different variety, and is placed here only tentatively.

Citations: BRAZIL: Acre Territory: Ule 9727 (B, Cb, K, Le). Pará: Burchell 9514 (K, K, K, Le, N, P, V); Ducke 971 (N); 3029 (Bm, W--1040313); Fróes 24318 (Be--43254); Guedes 2133 (Bm--isotype, Cb--isotype, Cb--isotype, Mi--photo of isotype, N--photo of isotype, P--isotype, W--1040260--isotype, Z--photo of isotype); Herb. Lusit. s.n. [Pará] (P); Martius 2590, in part (Mu--686), s. n. (Mu--687, Mu--688); Siqueira 3668 (Bm, Cb); Spruce 492 (Mu--689), s.n. [In vicinibus Para, Jul.-Aug. 1849] (K, N, V). State undetermined: Burchell 9633 (K, K, P).

VITEX TRIFLORA var. KRAATZII Huber, Bol. Mus. Goeldi 5: 216, pl. 2, figs. 12 & 13. 1909.

Synonymy: Vitex flavens x triflora Ducke ex Moldenke, Prelim. Alph. List Invalid Names 50, in syn. 1940.

Literature: Huber, Bol. Mus. Goeldi [Mus. Para.] 5: 216, pl. 2, figs. 12 & 13. 1909; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Alph. List Common Names 20. 1939; Moldenke, Prelim. Alph. List Invalid Names 50. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Alph. List Invalid Names 53. 1942; Moldenke, Phytologia 2: 122. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 67. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 203. 1949.

Illustrations: Huber, Bol. Mus. Goeldi [Mus. Para.] 5: 216, pl. 2, figs. 12 & 13. 1909.

This variety differs from the typical form of the species in its leaflets being thicker or even subcoriaceous in texture, smaller in size, 2--11 cm. long, 1--5.3 cm. wide, varying from 1 to 5 in number, regularly obtuse or emarginate at the apex or rarely abruptly short-acuminate, and usually densely velutinous-pubescent or subvillous on both surfaces (rarely sparsely short-pubescent), often subbullate and rubiginous, rarely only pubescent along the nerves beneath. The pubescence is more dense on the twigs, peduncles, and petioles, the hairs being rufous or flavescent in color. The secondaries are impressed above; the veinlet reticulation obscure or indiscernible on both surfaces. The inflorescence is short-pedunculate, contracted or more usually many-flowered. The calyx-tube is subinfundibular. The corolla is red and slightly surpasses the calyx.

The variety -- named in honor of Karl Alexander von Kraatz-Koschlau, head of the department of geology and mineralogy at the Museu Paraense, where he died of yellow fever in 1900 -- was based by Huber on Ducke 2873, collected on campos at Monte Alegre, Pará, Brazil, on July 16, 1902, and on Huber 1729, collected on the seashore at Braganca, Pará, Brazil, in December, 1899. Huber describes it as a small shrub, and Silva as a tree. The flowers are said by Traill to be "personate". It has been collected in anthesis and in fruit in July and December. A common name is "mammi-cachorri". The Huber cotype collection is actually anomalous in its sparsely short-pubescent leaflet-blades, while Traill 672 is unusual because of its abruptly short-acuminate leaflets. The Silva collection has long-villous "fruits", which are probably galled by insects and therefore abnormal.

Citations: BRAZIL: Maranhão: Lisbôa 2488 (Bm, Cb, N). Pará: Ducke 2873 (Bm--cotype, Cb--cotype, N--photo of cotype, P--cotype, W--1040308--cotype, Z--photo of cotype), 9921 (Cb, E--photo, N--photo, Z--photo); Huber 1729 (Cb--cotype, N--photo of cotype, Z--photo of cotype); N. T. da Silva 2 (Be--36033, N); Siqueira 6886, in part (Cb); Traill 672 (K).

VITEX TRIFLORA var. QUINQUEFOLIOLATA Moldenke, Phytologia 1: 104. 1934.

Synonymy: Vitex triflora var. quinquefoliata Moldenke, in herb.

Literature: Moldenke, Phytologia 1: 104. 1934; Moldenke, Geogr. Distrib. Avicenn. 24 & 27. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 35, 39, & 104 (1942) and [ed. 2], 74, 95, & 203. 1949.

This variety differs from the typical form of the species in having its leaflets 3 or 5 in number, mostly 5, and in its inflorescences being often many-flowered.

The type of the variety was collected by Boris Alexander Krukoff (no. 5765) on terra firma near the mouth of the Rio Macauhan (a tributary of the Rio Yaco) at latitude 9°20' S., longitude 69° W., Acre Territory, Brazil, on September 3, 1933, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is described as a slender tree, 15--45 feet tall, with a stem diameter of 3 inches and with its fresh foliage and other parts aromatic with the scent of sweetbrier (*Rosa rubiginosa*), especially when rubbed. In glabrescence its leaflets resemble those of the typical form of the species. The corolla is said by collectors to be sky-blue. A common name recorded is "tahuari", the same name as applied to the typical form. It ascends to 140 meters altitude in Peru, and Spruce describes it as rare. It inhabits forests, terra firma, and the gravelly shores of rivers. In anthesis it has been collected in August and December, and in fruit in September. *Klug 2791* exhibits 5 leaflets on the Geneva, St. Louis, and Washington herbarium specimens, but only 3 leaflets on the Arnold Arboretum, Kew, and New York specimens. The Krukoff collection shows 5 leaflets on the Arnold Arboretum, Kew, New York, Stockholm, and Utrecht specimens, but only 3 on the rest.

Citations: BRAZIL: Acre Territory: *Krukoff 5765* (A--isotype, B--isotype, Ca--605833--isotype, Cb--isotype, Cb--isotype, F--811835--isotype, F--811844--isotype, It--isotype, K--isotype, K--isotype, N--type, S--isotype, Ut--isotype). Pará: *Spruce 1039* (K, K, N), *s.n.* [in vicinibus Santarem, Aug. 1850] (B, Bm, Ed, Lu). PERU: Loreto: *Klug 2791* (A, Cb, E--1065360, K, N, W--1457177).

VITEX TRIFOLIA L., Sp. Pl., ed. 1, 638 [as "trifoliis"]. 1753.

Synonymy: *Piperi similis fructus striatus, femina* C. Bauh., Pinax Theatr. Bot. 412. 1671. *Vitex latiore folio* C. Bauh., Pinax Theatr. Bot. 475. 1671. *Caranosi* Rheede, Hort. Ind. Malab. 2: 13, pl. 2. 1679. *Vitex trifolia minor indica* Breyn. ex Pluk., Alm. Bot. 390, pl. 206, fig. 5. 1696. *Vitex trifolia floribus per ramos sparsis* Burm., Thes. Zeyl. 229, pl. 109. 1737. *Lagondium vulgare* Rumph., Herb. Amboin. 4: 48, pl. 18. 1743. *Vitex trifolia minor indica* Pluk. ex L., Sp. Pl., ed. 1, 638, in syn. 1753. *Vitex integerrimis* Mill., Gard. Dict., ed. 8, no. 3. 1768. *Vitex indica* Mill., Gard. Dict., ed. 8, in errat. 1768. *Vitex variifolia* Salisb., Prodr. Stirp. Hort. Allert. 107. 1796. *Vitex trifolia* var. *trifoliata* Cham., Linnaea 7: 107. 1832. *Vitex triphylla* Royle, Illustr. Bot. Himal. 299. 1839. *Vitex trifolia* var. *trifoliolata* Schau. in A. DC., Prodr. 11: 683. 1847. *Vitex agnus castus* var. *trifolia* (L.) Kurz, For. Fl. Brit. Burma 270. 1877. *Vitex agnus-castus* var. *subtrisecta* Kuntze, Rev. Gen. Pl. 2: 510 & 511. 1891. *Vitex agnus-castus* β *trifolia* (L.) Kurz ex Kuntze, Rev. Gen. Pl. 2: 510 & 511. 1891. *Vitex agnus-castus* Kurz apud Jacks., Ind. Kew. 2: 1213, in syn. 1895 [not *V. agnus-castus* L., 1753]. *Vitex incisa* Wall. apud Jacks., Ind. Kew. 2: 1213, in syn. 1895 [not *V. incisa* Lam., 1788, nor Bunge, 1927, nor Thunb., 1947]. *Vitex integerrima* Mill. apud Jacks., Ind.

Kew. 2: 1213, in syn. 1895. *Vitex trifoliata* L. f. ex E. D. Merr., Bur. Govt. Labs. 6: 17--18, *sphalm.* 1904. *Vitex langundi* Ridl., Journ. Roy. As. Soc. Straits 45: 50, hyponym. 1906. *Vitex trifoliata* P. Henderson, Handb. Pl., new ed., 482. 1910. *Vitex trifoliolata* Schau. apud P'ei, Verbenac. China 99, in syn. 1932. *Vitex trifolia* L. f. apud Benthall, Trees Calcutta 356, sphalm. 1933. *Piper similis fructus striatus, femina* Banks ex Moldenke, Prelim. Alph. List Invalid Names 36, in syn. 1940. *Vitex agnus-castus* var. *trifolia* (L.) Kurz ex Moldenke, Alph. List Invalid Names 52, in syn. 1942. *Vitex trifoliata* Lam. ex Moldenke, Alph. List Invalid Names Suppl. 1: 29, in syn. 1947 [not *V. trifoliata* Pav., 1940]. *Vitex triphylla* L. ex Moldenke, Alph. List Invalid Names Suppl. 1: 29, in syn. 1947. *Vitex trifoliata* L., in herb. *Vitis trifoliata* L. f., in herb. [not *V. trifoliata* Baker, 1871, nor Thunb., 1825].

Literature: C. Bauhin, Pinax Theatr. Bot. 412 & 475. 1671; Rheede, Hort. Ind. Malab. 2: 13, pl. 11. 1679; Ray, Hist. Pl. 3: 1575. 1688; Plukenet, Alm. Bot. 390, pl. 206, fig. 5. 1696; Burm., Thes. Zeyl. 229, pl. 109. 1737; Rumph., Herb. Amboin. 4: 48, pl. 18. 1743; L., Sp. Pl., ed. 1, 2: 638. 1753; N. L. Burman, Fl. Ind. 137. 1768; Mill., Gard. Dict., ed. 8, no. 3 & in errat. 1768; West., Univ. Bot. 1: 312. 1770; Lour., Fl. Cochinch., ed. 1, 2: 390. 1790; Poir. in Lam., Tabl. Encycl. pl. 541, fig. 2. 1794; Salisb., Prodr. Stirp. Hort. Allert. 107. 1796; Willd., Sp. Pl., 3: 392. 1801; Pers., Syn. Pl. 2: 144. 1806; R. Br., Prodr. Fl. Nov. Holl., ed. 1, 1: 511. 1810; Ait., Hort. Kew., ed. 2, 4: 67. 1812; Curtis, Bot. Mag. 47: pl. 2187. 1820; Roxb., Fl. Ind., ed. 1, 481. 1820; Thunb., Fl. Javan. 11. 1825; Cham., Linnaea 7: 107. 1832; Bojer, Hort. Maurit. 258. 1837; Royle, Illustr. Bot. Himal. 299. 1839; O'Shaughnessy, Beng. Dispens. 484. 1841; Schau. in A. DC., Prodr. 11: 683. 1847; Irvine, Short Acct. Mat. Med. Patna 118. 1848; Lindl., Med. & Oeconom. Bot. 223. 1849; Drury, Useful Pl. India 443. 1858; W. Elliot, Fl. Andhr. 180 & 190. 1859; F. Muell., Fragm. 3: 59. 1862; Van Tjiandjoer, Geneeskundig Tijdsch. 1: 690. 1862; Birdwood, Cat. Veg. Prod. Bomb. 66. 1865; Benth. & Muell., Fl. Austr. 5: 66. 1870; Baker in Mart., Fl. Bras. 14 (2): 212. 1871; Brandis, For. Fl. NW. & Cent. India 3: 370. 1874; F. Muell., Fragm. 9: 5. 1875; J. G. Baker, Fl. Maurit. & Seych. 256. 1877; Kurz, For. Fl. Brit. Burma 270. 1877; Blanco, Fl. Filip., ed. 3, 2: pl. 226. 1878; F. Muell., First Census 103. 1882; F. M. Bailey, Syn. Queensl. Fl. 379. 1883; Dymock, Veg. Mat. Med. W. Ind., ed. 2, 600. 1885; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 583. 1885; Ind. Forester 12: app. 19. 1886; F. Muell., Second Census 173. 1889; F. M. Bailey, Cat. Pl. Queensl. 35. 1890; Kuntze, Rev. Gen. Pl. 2: 510-511. 1891; Lubbock, Seedlings 2: 372. 1892; Moore, Handb. Fl. New South Wales 357. 1893; Watt, Dict. Econom. Prod. Ind. 6 (4): 201 & 251. 1893; Jacks., Ind. Kew. 2: 1213. 1895; Matsum., Bot. Mag. Tokyo 13: 121. 1899; Koord. & Val., Bijdr. Booms. Java 7: 200. 1900; A. DC., Bull. Herb. Boiss., sér. 2, 1: 581. 1901; F. M.

Bailey, Queensl. Fl. 4: 1179. 1901; Ridl., Journ. Roy. As. Soc. Straits 45: 50. 1906; Kloppenburg-Versteegh, Pl. Atlas pl. 15. 1907; P. Henderson, Handb. Pl., new ed., 482. 1910; Matsum., Ind. 2 (2): 534. 1912; F. M. Bailey, Compreh. Catal. 386. 1913; Publicaties Ned. Ind. Landb. Syndicaat 1914: 172. 1914; Koord. & Val., Atlas Baumart. Java pl. 292. 1914; E. D. Merr., Interpret. Rumph. Herb. Amboin. 453. 1917; Heyne, Nutt. Plant. Nederl. Ind., ed. 1, 4: 116. 1917; Léveillé, Cat. Pl. Yun-Nan 278. 1917; Basu, Ind. Medic. Pl. 3: 3, pl. 740b. 1918; H. J. Lam, Verbenac. Malay. Arch. 166, 180—183, & 370. 1919; Bakh. & Lam, Bull. Jard. Bot. Buitenz., sér. 3, 4 (2): 285. 1922; H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5 (2): 178. 1922; Ridl., Fl. Malay Penins. 2: 630-636 & 671. 1923; E. D. Merr., Enum. Philip. Pl. 3: 397. 1923; H. J. Lam in Engl., Bot. Jahrb. 59: 92. 1925; Heyne, Nutt. Pl. Nederl. Ind., ed. 2, 1319. 1925; Meager, Ann. Mus. Col. Marseille, sér. 4, 4: pl. 60. 1926; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 75, 77, & 85. 1928; Domin, Bibl. Bot. 22 (89-6): 1114. 1928; Hill, Ind. Kew. Suppl. 7: 252. 1929; Stapf, Ind. Lond. 6: 479. 1931; P'ei, Mem. Sci. Soc. China 1 (3):[Verbenac. China] 99. 1932; Kanehira, Fl. Micrones. 343. 1933; Benthall, Trees Calcutta 356. 1933; Crevost & Pételot, Bull. Econom. Indo-chine 37: 1294. 1934; Junell, Symb. Bot. Upsal. 4: 93. 1934; Dop, Fl. Gén. Indo-chin. 4: 834. 1935; Blumea 2: 262. 1937; Basu, Ind. Medic. Pl. 3: fig. 2499. 1938; Corner, Gard. Bull. Straits Settl. 10: 257. 1939; Moldenke, Alph. List Common Names 10, 14, 15, 18, 19, 28, 30, & 33. 1939; Moldenke, Geogr. Distrib. Avicenn. 41. 1939; Moldenke, Suppl. List Common Names 1—3, 7, 8, 10—13, & 16—24. 1940; Moldenke, Prelim. Alph. List Invalid Names 14, 29, 36, 49, 51, & 52. 1940; Moldenke, Suppl. List Invalid Names 11. 1941; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52, 53, 55—58, 60, 61, 63—70, 75, 103, & 104. 1942; Moldenke, Alph. List Invalid Names 12, 27, 36, 51—53, & 55. 1942; Moldenke, Phytologia 2: 122. 1944; E. D. Merr., Pl. Life Pacific World 33, 37, 39, 42, 46, 274, & 282. 1945; Van Steenis, Science & Scientists Neth. Ind. 339. 1945; Darlington & Janaki Ammal, Chromosome Atlas 271. 1945; Menninger, 1947 Cat. Flow. Trees 24—25. 1946; E. D. Merr., Chron. Bot. 10: 311. 1946; Menninger, Introd. Offer Flower. Trees Coll. [1]. 1946; Razi, Journ. Mysore Univ. 7 (4): 64. 1946; Benthall, Trees Calcutta 356—357. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 29. 1947; Terrac., Trav. Lab. Mat. Med. 33 (3): 101. 1947; Hara, Enum. Sperm. Jap. 1: 191. 1948; W. L. Phillips, Cat. Pl. Fairchild Trop. Gard. 41. 1949; Guillaumin, Bull. Mus. Hist. Nat. Paris, sér. 2, 21: 261. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 122—125, 128—130, 133—135, 138—140, 142, 143, 145—152, 155, 166, 201, & 203. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Fosberg, Pacific Sci. 3: 339. 1949; Menninger, Winter 1950 Seed List n.p. 1950; Menninger, 1950-1951 Offer. 300 Diff. Flow. Trop. Trees [4]. 1950; E. H. Walker, Import. Trees Ryukyo Isls. 285—286, fig. 185. 1954; Menninger, 1955 Price List n.p. 1954; Menninger, 1956 Price List [9]. 1955; St. John, Pacific Sci. 10: 101. 1956.

Illustrations: Rheede, Hort. Ind. Malab. 2: pl. 11. 1679; Pluk., Alm. Bot. pl. 206, fig. 5. 1696; Burm., Thes. Zeyl. pl. 109. 1737; Rumph., Herb. Amboin. 4: pl. 18. 1743; Poir. in Lam., Tabl. Encycl. pl. 541, fig. 2. 1794; Curtis, Bot. Mag. 47: pl. 2187 (colored). 1820; Blanco, Fl. Filip., ed. 3, 2: pl. 226 (colored). 1878; Lubbock, Seedlings 2: 372. 1892; Kloppenburg-Versteegh, Pl. Atlas pl. 15 (colored). 1907; Koord. & Val., Atlas Baumart. Java pl. 292. 1914; Basu, Ind. Medic. Pl. 3: pl. 740b. 1918; Mezger, Ann. Mus. Col. Marseille, sér. 4, 4: pl. 60. 1926; Basu, Ind. Medic. Pl. fig. 2499. 1938; E. H. Walker, Import. Trees Ryukyu Isls. fig. 185. 1954.

Slender bush, shrub, or shrubby tree, to 6.5 m. tall; stems to 15 cm. in diameter, freely branched from near the base; wood soft, whitish or yellowish or light-yellow except for the murky-brown center, moderately hard to very hard, often brittle, of fine to moderately fine texture, odorless and tasteless; bark smooth or (when old) finely checked, brown or light-brown; branches numerous, lax; branchlets and twigs slender, brownish, acutely or obtusely tetragonal or subterete, densely puberulent with sordid or cinereous hairs most conspicuous on the youngest parts; nodes annulate; principal internodes 1.5—5 cm. long; leaves decussate-opposite, mostly horizontal, resinous-aromatic when crushed, normally 3-foliolate, occasionally 1-foliolate; petioles slender, 0.6--3.3 cm. long, convex beneath, flattened and somewhat canaliculate above, densely appressed-puberulent with sordid or whitish hairs, not noticeably ampliate at the base nor disciform at the apex; leaflets subequal in size or the two lateral ones much smaller, the central one usually petiolulate on petiolules 1—6 mm. long, puberulent, and decidedly margined, the lateral ones usually sessile or subsessile; leaflet-blades thin-membranous, rich deep- or dark-green above, usually brunnescent or nigrescent in drying, white or grayish beneath, nearly flat or curved and subnitid on the upper surface, the central one varying from oblong-elliptic to oblanceolate or obovate, 2.5—7 cm. long, 1—4 cm. wide, acute or short-acuminate at the apex (varying to obtuse, rounded, or emarginate), entire, varying from acute or acuminate to cuneate-attenuate at the base, pulverulent-puberulent and more or less resinous-dotted above (especially when young), becoming glabrescent, sometimes more densely puberulent above and white-tomentose on the margins, densely tomentulose-puberulent with white or grayish matted hairs beneath, the lateral ones similar but usually smaller and sessile or subsessile and less attenuate at the base; midrib very slender, flat and usually more or less canescent above, prominulent beneath; secondaries very slender, 7—12 per side, arcuate-ascending, often branched, flat or subprominulent above, prominulent or hidden by the dense tomentum beneath, not anastomosing; vein and veinlet reticulation sparse, obscure or indiscernible on both surfaces; inflorescence terminal and axillary in the uppermost leaf-axils, paniculate, erect or suberect, 3--23 cm. long, 2—4 cm. wide, composed of many opposite stipitate and usually several times branched rather many-flowered cymes, cinereous- or sordid-puberulent throughout, often much abbreviated; peduncles (1--5 cm. long) and rachis slender, usually acutely tetragonal, similar to the adjacent twigs in color, texture, and puberulence; sympodia sometimes few and abbreviated, often numerous and 1--1.5 cm. long; pedicels very slender, about 1 mm. long or less, densely white-puberulent; bracts often present in the larger panicles, simple or 2- or 3-foliolate, foliaceous, resembling the leaves in texture, color, and puberulence, but much smaller, usually subtending only the lowest (or two lowest) pairs of cymes; bractlets and prophylla linear, 1--3 mm. long, densely white-puberulent; flowers odorless or with the fragrance of sage (Salvia officinalis), about 12 mm. long; calyx cyathiform, 4--5 mm. long, 2.5--3.5 mm. wide, 5-nerved, very densely white-tomentulose externally, its rim shortly and acutely repand-dentate or the teeth blunt; corolla hypocrateriform, varying from blue, pale-blue, or bright-blue to lavender, bluish, purplish, purple, or violet, 2-lipped, pulverulent or puberulent externally, its tube infundibular, 10--13 mm. long, the lower lip expanded into a villous tongue about 6 mm. long, the remaining lobes smaller; stamens 4, exserted; filaments hairy at the base; pistil exserted; fruiting-calyx cupuliform, herbaceous, about 5 mm. long and wide, densely cinereous-puberulent on the outside, its rim regularly 5-dentate; fruit drupaceous, at first green, then yellow or reddish, finally turning blue or black, globose or ovoid, 5--6 mm. long, about 5 mm. wide.

The species is widely distributed in its typical form from Afghanistan and Pakistan through all of tropical Asia north to southern China, Hainan, Japan, and the Liukiu Islands, westward to Mauritius, Madagascar, and Natal, and eastward through the Philippines and Indonesia to New Guinea, New Caledonia, Fiji, Samoa, Hawaii, and Australia. Watt describes it as a shrub or small tree found scattered throughout India in the tropical and subtropical regions from the foot of the Himalayas to Ceylon and Malacca, "nowhere common". Razi calls it a microphanerophyte in Raunkiaer's classification of life-forms, and records it from Mysore. Watt says "It is occasionally found in thickets and village shrubberies near Calcutta".

The wood is useful and the plant is employed extensively for making hedges in Sumatra. Degener says that it is used as a hedge in the Hawaiian Islands, while Clemens reports it as ubiquitous as a hedge in Queensland "as goats do not eat it" (but he admits that they ate a couple of branches of it when it was offered to them). It has been introduced in Madagascar on sand dunes to hold them in place, and it is probable that all the Madagascar and Mauritius records are based on introduced material. The leaves are a powerful discutient; in decoctions and infusions and as a cataplasm they are applied to enlarged spleens. Drury says that a clear sweet oil of a greenish color is extracted from the root and that the seeds are also supposed to yield a fatty oil. Watt states that the medicinal uses for V. trifolia are about the same as those enumerated in these notes for V. negundo L. It is cultivated for medicine in Thailand. Lindley reports that the leaves are employed by the Malays to remove "the boss". Marie-Louis Ter-

rac says "On emploie, en médecine locale les feuilles et les fruits qui contiennent un alcaloïde mal connu (Boorsma). Les feuilles renferment une essence dont les principaux constituants sont le pinène, le camphène, l'acétate de terpényle. Elles sont utilisées en cataplasmes résolutifs sur les rhumatismes, les ulcères de mauvaise nature. Elles présentent encore des vertus antiseptiques, dépuratives, emménagogues, et stimulantes."

Walker says that the wood is "used for excellent fuel but too small for other uses. The tree is a valuable shore protector and windbreak and the source of many drugs used for medicinal purposes. It is also a useful ornamental shrub because of its light appearance, blue flowers, and fragrance." He continues, "This small tree ranges in form down to a mere shrub creeping over the beach sand, this low variation usually called variety ovata and having predominantly simple leaves. The flowers are hardly distinguishable." We discuss this form under var. simplicifolia Cham.

Menninger describes the species thus: "This dainty Malayan shrub or small tree to 8 feet, has drooping, sprawly branches, attractive gray-green foliage and pretty blue flowers with the fragrance of sage. The leaves are resinous aromatic when crushed, and the under sides of the leaflets are hoary white felted. The pale blue flowers, about half inch long, are in rather narrow clusters to 5 inches long, 1--2 inches wide, and they come in great profusion and last several weeks.....blooming twice a year." He offers 8--15-inch seedlings for $1 each and 4-foot seedlings for $3 each, or 3--6-foot seedlings at 50 cents per foot, in Florida. He adds that "this plant looks like V. divaricata but blooms much more prolifically and is a much better plant." Fosberg records it as cultivated on Johnson Island in the central Pacific, while Bojer found it in cultivation in gardens at Port Louis and in the Royal Botanic Garden at Pamplemousse, Mauritius. Benthall says that the flowers are produced in the hot season at Calcutta. Perrier de la Bâthie says that in Madagascar the leaves are "persistent". Kienholz describes the fruit (erroneously) as a "capsule" and says that the leaves are "5-parted" (actually they are compound and 3-foliolate, the 5-foliolate form being var. bicolor) and show anisophylly very well. Kajewski says for his no. 84 that the leaves are "variegated with white", but actually the variegation which he seems to have observed is not the true discoloration as seen in var. variegata, but is caused mainly by the dense white tomentum of the lower surface continued on the leaf-edges. The conspicuously bicolored aspect of the leaflets on many herbarium specimens reminds one very strongly of var. bicolor, but the mostly 3 leaflets and their uniformly short petiolules well characterize the typical form of the species.

The original seeds from which the N. Taylor specimen, cited below, was grown were obtained from the Royal Botanic Gardens at Kew, England. The Herb. Lugd.-Bat. 908267-479 and 91313-124 and Ordets 15349, cited below, do not actually have indications on their labels that they came from cultivated material, but I assume that they did. The Natal specimen is from material said to have escaped from cultivation. The species has been recorded from the Salajar Islands in Blumea 2: 262 (1937).

Vernacular names for the plant include "ai toeban", "asla", "banj-angashte-abí", "danglá", "dinsaw", "doenoeko", "galoemi", "gĕndarasi", "hand of Mary", "hogagii", "Indian privet", "Indian wild pepper", "India three-leaved vitex", "jala-nirgundí", "kiyoubhán-bin", "konti saw", "lagoendi", "lagondi", "lagundi", "lagúndi", "lagundian", "lagundíng-dágat", "langghoendi", "langgoendi", "langkandi", "lanra", "lawarani", "lĕgoendi", "legoendi olie", "lègundi", "lenggundi", "lilégoendi", "liñgei", "lipuk", "man kinh", "mitsuba-hamago", "ndrala", "níra-lakki-gidá", "nir-noch-chi", "nír-noch-chi", "níru-vávili", "pani ka sanbhalu", "pání-kí-sanbhálú", "pání-kí-shanbálí", "páni-samálú", "pani sanbhaki", "panj-angushta-ábí", "quan âm", "que-ábi", "sagarai", "salah gundi", "sangari", "shiru-noch-chi", "shiru-varíli", "silagundi", "sisua noi", "sufed sanbhalu", "suféd-sanbhálú", "sunrasa-vrikshasha", "surasa-vrikshasha", "tella-vavíli", "thúôc kinh", "thuôc ôn", "tigau", "uljí-shabáli", "uljí-shanbáli", "vaturu-nikka", "wild pepper", and "yé-kiyouban-bin". It is to be noted that "ai toeban" is applied also to *V. negundo*, and so does "lĕnggúndi", while "danglá" applies also to *V. trifolia* var. *bicolor* and "sagarai" applies both to *V. trifolia* var. *bicolor* and *Avicennia marina* (Forsk.) Vierh. According to many writers the *vernacular names* applies to *V. trifolia* and *V. negundo* are the same. Moodeen Sheriff, however, states that the adjectives for "white" and for "water" which enter into so many of the names are properly applied only to *V. trifolia*.

In the Linnean Herbarium, *preserved* at the Linnean Society in London, under genus 790 [811], *Vitex*, sheet number 7 is inscribed "*trifolia*" and "India" and "413" in the handwriting of Linnaeus. There is a long description on the reverse side of the sheet. The leaves are 3-foliolate and the inflorescence-branches are divaricate. It is undoubtedly what we now know as *Vitex trifolia* L. Sheet no. 6 is also inscribed "*trifolia*", but is what we now call *V. trifolia* var. *bicolor* (Willd.) Moldenke. Sheet no. 10 is inscribed "*pinnata*" and there is the notation "Fl. Zeyl. 415" and "India D." [=*Dalman*]. Smith has struck out the epithet "*pinnata*" and has written in "minime; nil nisi *V. trifoliata* J. Sm. vera *V. pinnata* in H. B." [=Banks]. The leaves are 3-foliolate and *very white* beneath. It is plainly what we now call *V. trifolia*.

The *Vitex langundi* of Ridley, published as a hyponym in Journ. Roy. As. Soc. Straits 45: 50 (1906), was never really validly described. Ridlet merely says that it is an aromatic shrub with blue flowers, very commonly used in native medicines, called "langkandi" in the Mantra Gajah of the Malays. It is not listed by him in his Flora of the Malay Peninsula 2: 630--636 & 671 (1923). It is listed by Hill in Ind. Kew. Suppl. 7: 252 (1929), where it is referred to as a "nomen" only, and in my own Known

Geogr. Distrib. Verbenac., [ed. 1], 61 & 103 (1942) and [ed. 2], 139 & 201 (1949). It seems obvious, from the similarity of the specific epithet to vernacular names applied to V. trifolia, the brief descriptive phrase, the statement about medicinal uses, and other evidence, that the name belongs in the synonymy of V. trifolia.

Kuntze 5817 is apparently the type of V. agnus-castus var. subtrisecta Kuntze. It is labeled as from the Willisgebirge, Java, and Kuntze cites this as the type locality of the variety. The specimen seems to be typical V. trifolia. Another Kuntze specimen in the Britton Herbarium at New York, however, and numbered "4448" (or 4445?), bears Kuntze's diagnosis of the variety in his own handwriting. It was taken from material cultivated at Sindangbaja ("cult. Sindangbaja") and this locality is not mentioned by him in his original publication. It is a mixture of V. trifolia and its var. simplicifolia. His diagnosis of var. subtrisecta implies the characters of what we now call var. heterophylla, but what I regard as his type specimen (no. 5817) is typical V. trifolia L., so I am reducing his trinomial to the synonymy of the typical form of the species. The type was collected at 2000 feet altitude on August 28, 1875, while no. 4448 came from 3500 feet and was collected on May 25, 1875.

Specimens of Vitex trifolia have been confused with and misidentified in herbaria as V. agnus-castus L., V. litoralis L., V. negundo L., V. trifolia var. obovata Benth., and even Vitis trifoliata L. f. It has been collected at altitudes from sea-level to 1165 meters, blooming in every month of the year, in fruit in February, March, May, and from July to December. Collectors have found it in woods in sandy soil along the coast, in shrubbery of gulches, along seashores and beaches, in back of sandy beaches near habitations, in coastal thickets, on dunes, at the edges of lagoons, on slopes, in rocky pasture land, and in the littoral in general, but it is said to be common in the rainforests in New Hebrides. Guillaumin cites Buchholz 1536 from New Caledonia, and Lam cites Neuhauss 2 from Northeastern New Guinea, but the Toxopeus 631 cited by the latter authority from Buru is actually var. bicolor. Darlington & Janaki Ammal report the specues to have 32 chromosomes.

Citations: UNION OF SOUTH AFRICA: Natal: Collector undesignated s.n. (Na--14450). MADAGASCAR: Afzelius s.n. [Tamatave, 2.8.1912] (K, N); Baron 2232 (K, P), 2755 (K, P); d'Alleizette 1340m (P); Decary s.n. (P); Herb. Desvaux 519 (N, P); Humbert 3950 ter (P); Lindley s.n. [Madagascaria, 1826] (Br); Perrier de la Bâthie 10257 (P), 10270 (P), 18774 (P); Richard 321 (P); Viguier & Humbert 439 bis (P). MASCARENE ISLANDS: Mauritius: Richard s.n. [Ile de France] (P); Sieber 283 (P); Telfair s.n. (K). REUNION: l'Isle 478 (P). AFGHANISTAN: Herb. W. Griffith 6057 (Cm). INDIA: West Bengal: R. L. Heinig s.n. [Sunderabunds] (Na--4856). State undetermined:

Collector undesignated 413 [Herb. Linnaeus G.811, S.7] (Ls--type, N--photo of type, S--photo of type, Z--photo of type), s.n. (S); Dalman s.n. [Herb. Linnaeus G.811, S.10] (Ls, Mi--photo, N--photo, Z--photo); Herb. Mus. Bot. Stockholm 16 (S); Roxburgh s.n. (Br, Br); Wallich s.n. (Cp, Cp, Cp, Cp, N). PORTUGUESE INDIA: Goa: J. Correa 142.10 H (Xa); Santapau 142-1 H (Xa).BURMA: Tenasserim: Helfer 6057 (S). CEYLON: Thwaites 1955 (Br). CHINA: Yünnan: Forrest 9226 (S). HAINAN ISLAND: Henry 8568 (K); Wu 1086 (Du--250159). MALAYA: Penang: Haniff 29 (La). PHILIPPINE ISLANDS: Lubang: E. D. Merrill 957 (N). Luzon: De la Rosa s.n. [Gates 8494] (Ka--64771); A. D. E. Elmer 7877 (N, Vt); Kienholz 188 (Ur); Vanoverbergh 321 (Br, Go, Lu); Whitford 674 (N). Mindoro: M. T. Cruz 53 (Ur). Palawan: Merrill Sp. Blanc. 302 (Bz--25290). Polillo: R. C. McGregor s.n. [Herb. Philip. Bur. Sci. 10270] (Br). Island undetermined: Collector undesignated 88 (Q); Kienholz 84 [Herb. Philip. Bur. Sci. 15225] (Ur); Née 34 (Q), 52 (Q). SUMATRA: Bangham & Bangham 806 (K); Boeea 551 (Kr); Bünnemeijer 4439 (Bz--25313, Bz--25314); Galoengi 22 (Bz--25306); Iboet 248 (Bz--25311, Ut--82001); Jacobson 2078 (Bz--25201); Leefmans 68 (Bz--25209, Bz--25210); Lörzing 4161 (Bz--25207), 4946 (Bz--25206), 5776 (Bz--25309), 11144 (Bz--25312); Lutjeharms 4655 (N); Ouwehand 69 (Bz--25200); Posthumus 972 (Ut--97183); Pringgo Atmodjo 223 (Bz--25199); Toroes 910 (S). JAVA: Backer 4550 (Bz--25262), 4771 (Bz--25250), 15230 (Bz--25239), 33174 (Bz--25247), 33176 (Bz--25246); Bakhuizen van den Brink 1557 (Bz--25177), 6500 (Br); Edeling s.n. [Dec. 1862] (Bz--25178); Jensen s.n. (Cp); Kuntze 5817 (N, N); Selinek s.n. [Java] (Br); Vorderman s.n. (Bz--25252). SARAWAK: Native collector 278 (Ph). BORNEO: Amdjah 1226 (Bz--25228, Bz--25229); Labohm 1962 (Bz--25230); Posthumus 2072 (Bz--25166). CELEBES: Bünnemeijer 10828 (Bz--25293), 11153 (Bz--25294); Kjellberg 3888 (Bz--25191, S, S); Rachmat 983 [Vuuren 983] (Bz--25297), s.n. [Vuuren 108] (Bz--25302). LESSER SUNDA ISLANDS: Buton: Collector undesignated 345 (Bz--25319). Sumbawa: Rensch 901 (Bz--25187). Timor: Grijp 19 [Boschproefst. BB.20267] (Bz--25188). MOLUCCA ISLANDS: Amboina: C. B. Robinson 305 (N). NEW GUINEA: Northeastern New Guinea: Schlechter 14253 (Bz--25284). HAWAIIAN ISLANDS: Oahu: N. J. Andersson s.n. [Honolulu, 1852] (S, S, S). NEW HEBRIDES: Aneityum: Kajewski 801 (La). Tanna: Kajewski 66 (La), 84 (La). Island undetermined: Herb. Mus. Bot. Stockholm s.n. (S). NEW CALEDONIA: Eloin s.n. [Port de France?] (Br); Franc 56 (La); Germaine s.n. [1874--1876] (Br, N). FIJI ISLANDS: Vanua Levu: A. C. Smith 1075 (N), 4559 (N), 6078 (N), 6610 (N). AUSTRALIA: New South Wales: Herb. Mus. Nac. Hist. Nat. Chile 16030 (Sg). Queensland: F. M. Bailey s.n. [Moreton Bay] (Du--9526); Collector undesignated s.n. [Rockingham Bay] (Bz--25326); J. Dall s.n. [Rockingham Bay] (Na--

129); Stephen Johnson s.n. (Na--5890); F. Mueller s.n. [Fort Denison] (Br). CULTIVATED: Australia: M. K. Clemens s.n. [Charleville, Oct.-Nov. 1945] (Or--53351, Or--53352). Belgium: M. Martens s.n. (Br). California: Andersson s.n. [Californien, 1852] (S). China: McClure 58, in part (Ar--11240). Cuba: Acuña 18321 (Es). Florida: Crevasse s.n. [Simmons Park, 7/31/40] (Fl--33356); Menninger s.n. [Stuart, April 17, 1945] (N); Ordets 15349 (Es); Pearson s.n. [June, 1940] (Bu). Hawaiian Islands: Degener 9505 (N). India: Herb. Hort. Bot. Calcuttensis s.n. (Le, Le, Mu--682, X); Wallich 182 (Cp), 1743 (K), 1743g (B), 1746 (K). Java: Backer 22575 (Bz--25234); Herb. Lugd.-Bat. 908267-479 (Le); Kuntze 4448 (N). Kenya: R. M. Graham s.n. [MacNaughlan 171] (K). Mauritius: Bojer II.44 (V). Netherlands: Herb. Lugd.-Bat. 91313-124 (Le). New Hebrides: Kajewski 84 (K). New York: N. Taylor s.n. [N. Y. Bot. Gard. Cult. Pl. 13550] (N). Réunion: Richard s.n. [Bourbon] (P). Sumatra: Herb. Hort. Sibolangit 135 (Bz--26514). Thailand: Vanpruk 448 (K). Union of South Africa: Herb. Capetown Bot. Gard. s.n. (S). LOCALITY OF COLLECTION UNDETERMINED: T. Cooke s.n. (Mi); Herb. Shelton s.n. (Ka). MOUNTED ILLUSTRATIONS: Curtis, Bot. Mag. pl. 2187 (N).

VITEX TRIFOLIA var. BICOLOR (Willd.) Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 79. 1942.

Synonymy: Vitex bicolor Willd., Enum. Hort. Berol. 660. 1809. ? Vitex agnus-castus δ negundodes Kuntze, Rev. Gen. Pl. 2: 510 & 511. 1891. ? Vitex agnus-castus δ negundodes f. albiflora Kuntze, Rev. Gen. Pl. 2: 510. 1891. ? Vitex agnus-castus ε javanica Kuntze, Rev. Gen. Pl. 2: 510 & 511. 1891. Vitex negundo var. bicolor (Willd.) H. J. Lam, Verbenac. Malay. Arch. 191. 1919. Vitex petiolaris Domin, Bibl. Bot. 22 (89-6): 1115. 1928. Vitex iriomotensis Ohwi, Acta Phytotax. & Geobot. Kyoto 7: 29. 1938. Vitex ternifolia Hort., in herb.

Literature: Willd., Enum. Hort. Berol. 660. 1809; Schau. in A. DC., Prodr. 11: 683. 1847; Miq., Fl. Ind. Bat. 2: 860. 1856; Miq., Fl. Ind. Bat. Suppl. 1: 242 & 567. 1860; Benth. & Muell., Fl. Austral. 5: 67. 1870; Kuntze, Rev. Gen. Pl. 2: 510--511. 1891; H. Hallier, Meded. Rijks Herb. Leid. 37: 42. 1918; H. J. Lam, Verbenac. Malay. Arch. 191--193 & 369. 1919; H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 3: 56. 1921; Bakh. & Lam, Bull. Jard. Bot. Buitenz., sér. 3, 4 (2): 285. 1922; H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5 (2): 178. 1922; E. D. Merr., Enum. Philip. Pl. 3: 394. 1923; H. J. Lam, Nova Guin. 14: 169. 1924; H. J. Lam in Engl., Bot. Jahrb. 59: 27--28 & 93. 1925; Domin, Bibl. Bot. 22 (89-6): 1114--1115 & 1117, fig. 182. 1928; Wilder, Bishop Mus. Bull. 86: 93. 1931; Crevost & Pételot, Bull. Econom. Indo-chine 37: 1292--1293. 1934; Christoph., Bishop Mus. Bull. 128: 192. 1935; Ohwi, Acta Phytotax. & Geobot. Kyoto 7: 29. 1938; Moldenke, Alph. List Common Names 10, 18, 19, & 26. 1939; Moldenke, Prelim. Alph. List Invalid Names 50. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53, 55, 56, 58, 61, 63--66, 68, 69, 75, 79, & 104. 1942; Moldenke in A. C. Sm., Sargentia 1: 115. 1942; Moldenke, Alph. List Invalid Names 52. 1942; Kanehira & Hatusima, Bot. Mag. Tokyo 56: 116. 1942; Yuncker, Bishop Mus. Bull. 178: 102. 1943; Parham, Fiji Native Pl. 22. 1943; Moldenke, Phytologia 2: 122. 1944; Moldenke, Alph. List Invalid Names Suppl. 1: 29. 1947; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123, 128, 130, 135, 139, 142, 143, 145--152, 155, 166, & 203. 1949; Ciferri, Mycopath. & Mycol. Appl. 6: 19--27. 1951; Biol. Abstr. 26: 882 & 3851. 1952.

Illustrations: Domin, Bibl. Bot. 22 (89-6): fig. 182. 1928.

This variety differs from the typical form of the species in having its leaves mostly 5-foliolate, decidedly silvery and white-tomentose beneath, the upper surface always nigrescent in drying, imparting to the leaves a decided black-and-white bicolored appearance.

It is a straggling shrub or small spreading tree, 1--10 m. tall; trunk often 4 cm. in diameter; bark rough; young branches and petioles densely tomentose; leaflets mostly 5, sometimes 3 or 4, rarely 1, conspicuously bicolored, elliptic-lanceolate, the two lowest on each of the 5-foliolate leaves smaller and sessile or subsessile, the 3 central ones on petiolules to 2 cm. long; flowers slightly aromatic, the corollas varying from blue or bluish-purple to lavender, lilac, or pink, often deeper blue inside, 5--8 mm. long, borne in large branching axillary or terminal clusters; fruit small, green, turning brown [or yellow?], eventually brownish-black, blue-black, or black when ripe, round.

The variety is found from Madagascar and the Comoro Islands eastward along the coasts of India, Ceylon, and Malaya, north to Hainan, thence through Oceania from the Philippines and Indonesia to New Guinea, Fiji, New Caledonia, Hawaii, the Solomon Islands, and Samoa, south to the coasts of Australia. Among its recorded vernacular names are "agalonte", "dablan", "dabtan", "danflá", "danglá", "daon lagondi", "dauhon lagondie", "drala-kaka", "dralasala", "dralawa", "gamulega", "kaju labundèn", "kakawkaw", "klesechedui", "klschochodúi", "klsegathui", "lagondi", "lagundí", "lala", "lala taki", "lala tea", "legoendi", "liñgei", "líñgei", "molokaka", "muzu", "namulega", "namulenga", "ndrala", "rara", "sagarai", "shaehl", "similotch mananeraba", and "tjimèjong". It is worthy of note that some of these names, or variants of them, such as "danglá" and "liñgei", apply also to the typical form of *V. trifolia*; "sagarai" is applied also to *Avicennia marina* (Forsk.) Vierh., while "drala-kaka" is a name for *Erythrina ovalifolia* Roxb.

The variety is usually described as common along the edge of the sea, on sandy coasts, in thickets near the beach, on the beach at the edge of light rainforests, and common in low wet sections and swampy land, but on Lele Island it is said to be "uncommon along the strand". It has been found from sea-level to altitudes of 665 meters in the Himalayas. Herbarium material has been confused with and misidentified as V. negundo L., V. paniculata Lam., V. triphylla L., V. trifolia L., V. trifolia var. trifoliolata Schau., and V. trifoliolata L. It has been collected in anthesis from August to June, and in fruit from September to February and in May and June.

I cannot agree with Dr. Lam that this plant's affinity is closest to the Indian V. negundo. It always grows in a similar habitat as V. trifolia and, indeed, often in close association with the typical form of the species (3 leaflets), with var. heterophylla (1--3 leaflets), and with var. simplicifolia (1 leaflet). Its inflorescence characters all point unmistakably to a very close affinity with V. trifolia, rather than with V. negundo. The confusion doubtless arose through the fact that so many Asiatic specimens of V. trifolia and its varieties have in the past been misidentified as V. negundo in herbaria throughout the world. Kajewski says "fruit yellow when ripe", but this is highly questionable. In Samoa the leaves are rubbed on the head and body of patients in the treatment of fevers. They are also made into poultices to place on abrasions. In Fiji they are used to treat abscesses of the ear, while in the Solomons the macerated bark and sap are placed against the teeth in cases of toothache according to Kajewski. Mrs. Parham states that "The Fijians value the leaves of this pretty plant for the medicinal properties, especially for abscess in the ear -- and for this purpose they chew the leaves together with the soft inner stem of the gasau grass (Eulalia japonica), and put the pulp thus obtained into the orifice of the ear. They then take a young shoot of the gasau and use it as a probe wherewith to break the abscess. In Vanua Levu, especially in the dry zone, this shrubby plant grows as a rule close to the ground, in a thick mass of scented leaves. In Viti Levu it is often found growing as a small tree."

In the Linnean Herbarium, preserved at the Linnean Society in London, sheet no. 6 under the genus Vitex is inscribed "trifolia" and "cagendi laut" in Linnaeus' own handwriting. The leaves are 5-foliolate, although the 2 basal leaflets are very small. It is certainly what we now call var. bicolor.

The Jarvis Island specimen cited below is said to be from "a single introduced plant growing near the house". Ciferri describes the hyperparasitic fungus Arthrobotryum gorgoneum Ciferri, which he found to grow parasitically on Irenina vilis (Sydow) Stevens [Meliola vilis Sydow], which, in turn, is parasitic on Callicarpa and on Vitex trifolia var. bicolor.

The Walker & Tawada 6749 cited below is actually a merotype of Vitex iriomotensis Ohwi. It was collected at the upper edge of the beach in the village, Yaetama Gunto, F. Bay -- "the only place known" on Iriomote Island. The "varieties" negundodes and javanica, published by Kuntze under V. agnus-castus in 1891 --

the former from Deccan, India, and the latter from Java -- may possibly prove to be the same as what I am calling var. *bicolor*. If so, then his names have priority over the epither "*bicolor*", provided that the Greek letters which he uses to separate the specific from the subspecific part of the names are regarded as equivalent to what we now call "variety". He differentiates the two by saying that in *negundodes* the leaflets are 5--8 times as long as wide, in *javanica* as long as wide to twice as long as wide, while in *V. negundo* they are two and a half to 4 times as long as wide. Not having seen his types of these particular taxa, I am not certain that they are correctly placed here. Kuntze also proposed a *Vitex agnus-castus* δ *negundodes* f. *albiflora* for a white-flowered form. As yet I have not seen any record or specimen of a white-flowered form of var. *bicolor*.

If Bentham's *V. trifolia* var. *parviflora*, published in his Fl. Austral. 5: 67 (1870) -- on which *V. benthamiana* Domin is based -- really proves to be the same entity as what I am calling var. *bicolor*, as seems very likely from the description and figure, then Bentham's varietal epithet will have to be the one adopted for the taxon [Bibl. Bot. 22 (89-6): 1114 & 1117, fig. 182. 1928].

Dr. Lam in Verbenac. Malay. Arch. 193 (1919) regards *Volkens 425* from the island of Yap as a hybrid between "*Vitex negundo* var. *bicolor*" and "*Vitex trifolia* var. *trifoliolata*". He notes that it has often 1-foliolate leaves, the terminal one usually petiolulate, corollas 8--9 mm. long, and calyx 2--2.5 mm. long, and that it appears to be quite fertile. To me it seems to be only *V. trifolia* var. *bicolor*, nothing more. He cites, in addition to specimens cited by me (below), the following specimens: -- from Banka: *Herb. Utrecht 44165*; from Java: *Kuhl & Hasselt s.n.* (Le--918210-52), *Junghuhn s.n.* (Le--908267-566, Le--918210-52), *Ploem s.n.* (Le--90927-151), *Blume s.n.* (Le--908267-47, Le--908267-93), *Waitz s.n.* (Le--908267-51), *De Vriese & Teijsmann s.n.* (Le--908267-270), and *Herb. Hasskarl s.n.* (Le--908267-81); from Sumbawa: *Elbert 3729*, *3927*, and *4118*; from Timor: *Zippel s.n.* (Le--908267-464); from Flores: *Weber s.n.* (Le--908267-83); from Kalao-Toa: *Docters van Leeuwen-Reijnvaan 1513*; from Celebes: *Elbert 2986* and *Forsten s.n.* (Le--908267-718, Le--908267-720); from Moena Island: *Elbert 2873*; from Kabaena Island: *Elbert 3337*; from Banda: *Herb. Leiden 908267-474*; from the Molucca Islands: *Reinwardt s.n.* (Le--908267-363); from Amboina: *Forsten s.n.* (Le--908266-1214); from Basilan: *Tarrosa 19553*; From Luzon: *Rosenbluth & Tamesis 12708*; from New Britain: *Lauterbach 166* and *Dahl 149*; from the Pelew Islands: *Kraemer s.n.*; from Korror: *Raymundus 178* and *Ledermann 14122*; from Truk: *Kraemer s.n.*; from Ponape: *Ledermann 13631*; and from Saipan: *Höfer 25* and *Haenke s.n.* He also cites *Schlechter 14253* from New Guinea, but I regard this collection as typical *V. trifolia*. He cites the *Wight s.n.* (Ut--49906) specimen as from "Malaya", instead of from India. He also reports that the specimen of Lewandowsky 48 which he examined exhibits one 1-foliolate leaf. Actually 1-foliolate leaf-like bracts are normally found in both V. trifolia and var. bicolor, but these are in or immediately subtending the inflorescences. In var. heterophylla the 1-foliolate leaves are scattered all through the foliage on all parts of the twigs, branchlets, and branches.

Meeuse, in a letter to me dated December 9, 1953, states that "Dr. Backer who has always been an extremely keen observer in the field, convinced me of the differences between Vitex bicolor and the species to which it is often referred (e.g., by Lam and Bakhuizen v. d. Brink). The differences in the florescence, etc., also coincide with ecological differences. I see that you reduce it to V. trifolia L. var. bicolor (Willd.) Moldenke, but the differences are constant and indicate a specific rather than varietal rank."

Citations: COMORO ISLANDS: Anjouan: Lavanchie s.n. (P). Mayotte: Boivin 3224 (P); Humblot 218 [Herb. Reichenbach f. 35381] (P, V). NOSY-BE: Boivin 2082 (P). MADAGASCAR: Baron 6546 (P), 6623 (P); Bernier 85 (P); Boivin 1795 (P, P), s.n. [1847-1852] (P); Commerson s.n. [Madagascar] (P); Forbes 2 (K); Herb. Mus. Paris 87 (P); Richard s.n. [1837] (P), s.n. (P). MASCARENE ISLANDS: Mauritius: Sieber Fl. Maurit. II.161 (M). INDIA: Bombay: Hohenacker 703 (S). United Provinces: Strachey & Winterbottom s.n. (Os). State undetermined: Osbeck s.n. (S, S); Roxburgh 2619 (Br); Voigt s.n. [Ind. orient.] (Cp, Cp, Cp, Cp); Wight s.n. (Ut--49906). CEYLON: Collector undesignated 34 (Le), 69 (Le). LIUKIU ISLANDS: Iriomote: Walker & Tawada 6749 (N). PHILIPPINE ISLANDS: Luzon: Ahern 166Q (Bz--24417), 223Q (Bz--24422), 255 (N), 255Q (Bz--24421); Borden s.n. [Herb. Philip. Forest Bur. 2035] (Bz--24315, N); A. D. E. Elmer 15236 (Ut--67401), s.n. [Los Banos, Apr. 1906] (Bz--24416); Haenke 567 (N), s.n. [1792] (N); Herb. Swartz s.n. (S); E. D. Merrill 1106 (N), Sp. Blanc. 440 (Bz--24410); R. Meyer s.n. [Herb. Philip. Forest Bur. 2276] (Bz--24419, N); Née 44 (Q); M. Ramos s.n. [Herb. Philip. Bur. Sci. 27118] (Bz--25287); E. M. Weiss 3564 (Bz--24423); R. S. Williams 185 (N, N). Masbate: W. W. Clark s.n. [Herb. Philip. Forest Bur. 2527] (Bz--24420, N). Mindanao: Ahern 671 (N), 671Q (Bz--24418); A. D. E. Elmer 11999 (Bz--24413, N); D. P. Miranda s.n. [Herb. Philip. Forest Bur. 17976] (Cm); R. S. Williams 2978 (N, N), 3026 (N, N). Island undetermined: Collector undesignated 27 (Q); Cuming 1866 (V); Née 26 (Q). MARIANNA ISLANDS: Guam: P. Nelson 522 (Bz--25220), 535 (Bz--25218); J. B. Thompson 439 (Bz--25327). Saipan: Kanehira 1025 (N). Island undetermined: Haenke 772 (N), s.n. [1792] (Gg--267593). CAROLINE ISLANDS: Lele: Glassman 2716 (W). Yap: Volkens 425 (Bz--24435). SUMATRA: Lütjeharms 4655 (Bz—

24317). VERLATEN ISLAND: Backer s.n. [April 1906] (Bz--24429); Leeuwen-Reijnvaan 3834 (Bz--25214). MADURA ISLAND: Backer 19352 (Bz--24377, Bz--24378), 19623 (Bz--24381), 20825 (Bz--24379, Bz--24380). KRAKATOA: Beumee A.210 (Bz--24318); Docters van Leeuwen-Reijnvaan 11740 (Bz--25213). JAVA: Backer 1448 (Bz--24343, Bz--24344), 8159 (Bz--24360, Bz--24361, Bz--24362), 9445 (Bz--24353), 15621 (Bz--24358, Bz--24359), 17574 (Bz--24382, Bz--24383, Bz--24384, Bz--24385), 24659 (Bz--24341, Bz--24342), s.n. [Aug.1903] (Bz--24352, Bz--24355, Bz--24356), s.n. [Feb. 1904] (Bz--24354), s.n. [April 1906] (Bz--24357); Bakhuizen van den Brink 1479 (Ut--24873a), 6580 (Ut--80700); Boschma 10 (Bz--24340); Clason C.90 (Bz--24261); Clason-Laarman 970 (Bz--24263); Endert s.n. [Boschproefst. E.1134] (Bz--24262); H. Hallier s.n. [15.6.96] (Bz--24345, Bz--24346); Hoed 26 (Bz--25175); Hoogerwerf 2 (Bz--24267), 4 (Bz--24266); Karta 279 (Bz--24308), 331 (Bz--24307), 412 (Bz--24309); Koorders 103 (Bz--24376), 199 (Bz--24275), 11853b (Bz--24364), 22488b [2320*] (Bz--24366), 27615b [436*] (Bz--24368, Bz--24369), 29118b [1145*] (Bz--24373), 29994b [1823*] (Bz--24374, Bz--24375), 34349b [2742*] (Bz--24365), 37132b [1423*] (Bz--24367); E. M. Meyer s.n. [1842] (M); Ploem s.n. [Java] (Bz--24363); Scheffer s.n. [Batavia] (Bz--24460); Slooten 2679 (Bz--24277); Van Steenis 4468 (Bz--25173). MAS BESAR: Valeton s.n. [2/3/05] (Bz--24274). BOKOR: Backer 31099 (Bz--24271, Bz--24272). NOORDWACHTER: Backer 35080 (Bz--24269, Bz--24270); Boschma 54 (Bz--24264, Bz--24265). BATAVIA BAY ISLANDS: Edam: Backer 31021 (Bz--24273); Pulle s.n. [24/IV/1906] (Ut--49907). BORNEO: Rutten 61 (Ut--16968, Ut--16969); Wilkes 40 (T), s.n. [U. S. Explor. Exped.] (C). CELEBES: Kjellberg 130 (Bz--24316, S); Koorders 19555b [299] (Bz--24424), 19557b [2177] (Bz--24425, Bz--24426); L. Riedel 5836 (Bz--24430, Ut--11558). KANGEAN ARCHIPELAGO: Kangean: Backer 26801 (Bz--24297, Bz--24298), 27185 (Bz--24295), 27568 (Bz--24289, Bz--24290, Bz--24291), 28047 (Bz--24296); Dommers 256 (Bz--24301). Paliat: Backer 29377 (Bz--24292). Saboenting: Backer 29779 (Bz--24302). Saoebi: Backer 28321 (Bz--24299, Bz--24300, Bz--25662). Saseel: Backer 28737 (Bz--24303, Bz--24304). Sepandjang: Backer 28963 (Bz--24305, Bz--24306). Sepapan: Backer 28487 (Bz--24293, Bz--24294). LESSER SUNDA ISLANDS: Bali: Paardt 49 (Bz--24310). Banka: Amand 466 (Ut--44165); Bünnemeijer 1533 (Bz--24427); Collector undesignated 21 (Ut--44163); Kurz s.n. [Banka] (Bz--24428). Pinie: Raup 509 (Bz--25320). Sumbawa: Bloembergen 3076 (Bz--72653). Timor: Collector undetermined 800 (Bz--24312). MOLUCCA ISLANDS: Amboina: Boerlage 145 (Bz--24394), 319 (Bz--24395); Boesveld s.n. [Sept. 1921] (Bz--24390); C. B. Robinson 305 (Bz--24391); Treub 366 (Bz--24392, Bz--24393). Bisa: Link 45 (Bz--24386). Buru: Teijsmann s.n. (Bz--24401, Bz--24402); Toxopeus 631 (Bz--24396). Ceram: Kornassi 926 (Bz--24400, N, Ut--80724); Rutten 111 (Bz--24399, Ut--80735), 1774 (Bz--24397, Bz--24398). Morotai: Main & Aden 740 (Bz--72882). Obi: Atasrip 92 (Bz--24387, Bz--24388, Bz--24389). Sula: Atje s.n. [Hulstijn 107] (Bz--24403, Bz--24404). Taliaboe: Bloembergen 4788 (Bz--24313). Tanimber Islands: Buwalda 4411 (Bz-72599). NEW GUINEA: Dutch New Guinea: Janowski 518 (Bz--24407, Bz--24408); Kostermans 2916 (Bz--72834); Pleyte 487 (Bz--72881). Japen Island: Aet & Idjan 348 (Bz--72974). Northeastern New Guinea: Hollrung 486 (Bz--24406, Mb, Mb); Lewandowsky 48 (Bz--24405, S, S); Nyman 210 (S). Papua: Brass 859 (Bz--24314); J. B. Chalmers s.n. [South Cape] (Mb); W. V. Fitzgerald 13 (Mb). Schouten Island: Feuilletau de Bruyn 4141 (Bz--24409). LOUISIDADE ARCHIPELAGO: Rossell: W. MacGregor s.n. [1889] (Mb). HAWAIIAN ISLANDS: Oahu: Gemzell s.n. [Juni 1927] (S). BISMARK ARCHIPELAGO: New Britain: R. Parkinson s.n. [1901] (Vt). SOLOMON ISLANDS: Guadalcanal: Kajewski 2417 (Bz--25219, S). NEW HEBRIDES: Aneityum: Kajewski 801 (V). NEW CALEDONIA: Eloin s.n. (Br); C. Skottsberg 9 (S). TONGAN ISLANDS: Nomuka: Yuncker 15801 (Yu, Z). Tongatapu: Banks & Solander 1769 (S); Setchell & Parks 15296 (S); Yuncker 15011 (Ss, Yu). FIJI ISLANDS: Fulanga: A. C. Smith 1200 (N). Kandavu: A. C. Smith 314 (G, N). Makondronga: Degener & Ordonez 13815 (A). Vanua Levu: Degener & Ordonez 14058 (A, N); A. C. Smith 6622 (N). Viti Levu: Degener & Ordonez 13620 (A, N), 13691 (A, N). SAMOAN ISLANDS: Ofu: Yuncker 9566 (Dp--29051). Tau: D. W. Garber 611 (Bz--24432, N); Yuncker 9104 (Dp--29052). Upalu: A. J. Eames 36 (N); Graeffe 1581 (Pa). NIUE: Yuncker 10041 (Dp--29050). AUSTRALIA: New South Wales: Herb. Prager 18675 (Gg--31486). Queensland: M. K. Clemens s.n. [Jericho, March-April 1946] (Or--56349); F. Mueller s.n. [Rockingham Bay, 1869] (Bz--25328), s.n. [Endeavour River] (Bz--25330). BRIBIE ISLAND: M. K. Clemens s.n. [April 20-30, 1944] (Or--49643, Or--49644). HAYMAN ISLAND: C. T. White 10167 (N). LINE ISLANDS: Jarvis: A. C. Browne s.n. (Du--270471). CULTIVATED: Java: Bakhuizen van den Brink 6580 (Bz--24347, Bz--24348, Bz--24349, Bz--24350, Bz--24351); Herb. Hort. Bot. Bogor. II.Q.C.24 (Bz--25756), XV.F.52a (Bz--26353, Bz), XV.J.A.(XXXV).6 (Bz--2433, Bz--24334, Bz--24335), XV.J.A.XXXV.7 (Bz--26420, Bz--26421, Bz, N), s.n. (Bz--24336, Bz--24337, Bz--24338); Herb. Lugd.-Bat. 908267-49 (Le, N--photo, N, Z--photo). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated 467 (Ut--44164).

VITEX TRIFOLIA var. HETEROPHYLLA (Mak.) Moldenke, Phytologia 3: 178. 1949.

Synonymy: Vitex rotundifolia var. heterophylla Mak., Ill. Fl.

Nipp. 186. 1940.

Literature: Kuntze, Rev. Gen. Pl. 2: 510--511. 1891; Mak., Ill. Fl. Nipp. 186. 1940; Hara, Enum. Sperm. Jap. 1: 191. 1948; Moldenke, Phytologia 3: 178 (1949), 295 & 381 (1950), and 461--463 & 468. 1951; Moldenke in Humbert, Fl. Madag. 174: 82--83 & 273.1956.

This variety differs from the typical form of the species in being a dwarf or prostrate shrub with both 1-foliolate and 3-foliolate leaves regularly interspersed on the branchlets. It is said to be woody or semi-woody, to 3 m. tall, the stem to 4 cm. in diameter. The entire plant has the fragrance of desert sagebrush (*Artemisia tridentata* Nutt.), the leaves being especially fragrant. The leaflets on 1-foliolate leaves are usually broader, more oblong in shape, and more obtuse at both ends than those on 3-foliolate leaves. The corollas are blue, reddish-purple, or white (*Tsui 286*).

The variety is found chiefly along seashores from Madagascar and Mauritius through India, the Andaman Islands, Indochina, and Malaya, north to Hainan, Kwangtung, and Japan, and eastward through Indonesia to the Lesser Sunda Islands, Moluccas, New Caledonia, Fiji, and Queensland. It is sometimes cultivated in Europe and Indonesia. On Hainan it is found along roadsides, in village commons, and is said to be fairly common on dry or moist gentle slopes in sand of seashores, ascending to 750 meters altitude. It is regarded as a medicinal plant in Mauritius, while in Sumatra, according to Hayes, all parts of the plant are used in treating fevers. It has been collected in anthesis in February to April, June to August, October, and December. It has been confused by herbarium workers with and misidentified as *V. negundo* L.

The *Skottsberg 5* cited below consists of mostly 1-foliolate leaves and only a few 3-foliolate ones. The Bijoux collection from Mauritius bears a label stating that it is "a medicinal plant" growing at low levels. The Riedel collection from Gorontalo is a mixture with a species of *Acacia*. Our plant is called "vone lang" on Hainan Island.

Kuntze's description of his *V. agnus-castus* γ *subtrisecta*, collected in Java at 2000 feet altitude, implies var. *heterophylla*, but his type specimen seems to be *V. trifolia* in its typical form. I am therefore placing his trinomial in the synonymy of the typical form of *V. trifolia*.

Citations: MADAGASCAR: *Afzelius s.n.* [Tamatave, 2.8.1912] (S); *Kaudern s.n.* [Tamatave, 10.2.1912] (S). MASCARENE ISLANDS: Mauritius: *Bijoux s.n.* (Bz--25331). INDIA: West Bengal: *C. E. Parkinson 4335* (N). ANDAMAN ISLANDS: South Andaman: *Prain s.n.* [15/11/1889] (Br). CHINA: Kwangtung: *Chun 7625* (Bz--25221). Yünnan: *Henry 12302a* (N). Province undetermined: *Hooker s.n.* [China] (C). HONAM ISLAND: *Hom A.387* [Herb. Lingan Univ. 18794] (N). HAINAN ISLAND: *Fung 20300* (Bz--25227, N); *Gressitt 1131* (I); *Lau 270* (Mi, N). HONGKONG: *Tsui 286* (N). INDOCHINA: Annam: *Herb. Torrey* s.n. [Turou, Note B.5.19] (T). Cochinchina: Harmand s.n. [Ba Yoe prés Ha Tien, 1875] (Bz--72859). THAILAND: Haniff & Nur 3584 (Bz-25215); Kerr 1248 (Bz--25325). MALAYA: Trengganu: Corner 33492 (Bz--25225). LIUKIU ISLANDS: Iriomote: Walker & Tawada 6601 (N), 6602 (N). Okinawa: Carow 5 (W--1991962). Yaeyama: Lehmboden 96 (N). PHILIPPINE ISLANDS: Luzon: H. M. Curran s.n. [Herb. Philip. Forest Bur. 5295] (Br); A. D. E. Elmer 7877 (Bz--25288), 15236 (Bz--25286, N, S); Merritt & Darling s.n. [Herb. Philip. Forest Bur. 14079] (Bz--25289); Vanoverbergh 321 (S). Palawan: E. D. Merrill Sp. Blanc. 302 (N). Panay: Edaño s.n. [Herb. Philip. Bur. Sci. 46232] (S); Ramos & Edaño s.n. [Herb. Philip. Bur. Sci. 31523] (Bz--25285). SIMALUR ISLAND: Achmad 45 (Bz--25321). SUMATRA: Ajoeb 7 (Bz--25202); Bünnemeijer 2517 (Bz--25315), 2975 (Bz--25316), 5649 (Bz--25317), 7995 (Bz--25204, Ut--58760); Grashoff 963 (Bz--25194); Gusdorf 30 (Bz--25195); Hayes s.n. (Bz--25203); Herb. Jard. Bot. Brux. s.n. [Sumatra] (Br); Lörzing 3797 (Bz--25208), 6268 (Bz--25308), 8006 (Bz--25205), 8974 (Bz--25307), 10066 (Bz--25212); Van Steenis 3345 (Bz--25196, Bz--25197), 5875 (Bz--25198); Voogd 1355 (Bz--25192, Bz--25193, Bz--25671); R. Wind 26 [Boschproefst. BB.9843] (Bz--25211). MADURA ISLAND: Backer 19416 (Bz--25277), 19895 (Bz--25275, Bz--25276), 21149 (Bz--25278). BAWEAN ISLAND: Buwalda 3055 (Bz--73022); Dorgelo 4 (Bz--25180), 53 (Bz--25181). JAVA: Backer 2541 (Bz--25258), 4550 (Bz--25261), 4771 (Bz--25251), 6828 (Bz--25259), 9554 (Bz--25265), 11962 (Bz--25253, Bz--25254), 15230 (Bz--25238, Bz--25240), 16394 (Bz--25241, Bz--25242), 16615 (Bz--25255, Bz--25256), 22860 (Bz--25245, Bz--25673), 23189 (Bz--25232), 24283 (Bz--25263, Bz--25264), 26430 (Bz--25235, Bz--25236), 33174 (Bz-25248), 33175 (Bz--25249), 33177 (Bz--25244); Brascamp 12 (Bz--25169); Brinkman 551 (Bz--25168); Buysman 252 (Ut--53408); Collector undesignated 654b (Bz--25170); Grutterink 3112 (Bz--25260); Hoffmannsegg s.n. [Java] (Br); Jeswiet s.n. [1916] (Ut--71063); Karta 56 (Bz--25179); Kobus 264 (Bz--25269); Koorders 15559b (Bz--25270), 25043b [2209*] (Bz--25272, Bz--25674), 28038 [923*] (Bz--25273), 36203b [1902*] (Bz--25271), 38790b [1480*] (Bz--25274); Mousset 1118 (Bz--25268); Reinwardt s.n. (S); Slooten 2649 (Bz--25243), 2697 (Bz--24276); Ultee 25 (Bz--25266); Westendorp s.n. [Batavia] (Br); Winckel 1140b (Bz--25176); Zollinger 2559 (Bz--25267). BATAVIA BAY ISLANDS: Klein Kombius: H. J. Lam 2173 (Bz--25231). JAMBONGAN ISLAND: Cabiling 3691 (Bz--25167). CELEBES: Bünnemeijer 10633 (Bz--25291, Ut--80733), 10828 (Bz--25292), 11234 (Bz--25295), 12305 (Bz--25296); Noerkas 36 [Vuuren 36] (Bz--25298); Rachmat 35 (Bz--25301), 108 (Bz--25303); J. G. F. Riedel s.n. [Gorontalo] (Bz--25303, in part); Saimoendt 61 [Posthumus 972] (Bz--25310); Teijsmann 12706 (Bz--25304); Vuuren s.n. [30.III.12] (Bz--25299, Bz--25300). LESSER SUNDA ISLANDS: Banka: Bünnemeijer 1467 (Bz--25318). Flores: Horst 44 (Bz--25182); Posthumus 3426 (Bz--25183); Rensch 1053 (Bz--25184); Veeartsenijk. Dienst. 55 (Bz--24311). Lombok: Harreveld s.n. [4 Oct. 1920] (Bz-25136); Rensch 43 (Bz--25135). Sumbawa: Bloembergen 3074 (Bz--72652). Timor: Forbes 3726 (Bz--25279, Bz--25280), 3730 (Bz--25281); M. E. Walsh 134 (Bz--25189, Bz--25190). MOLUCCA ISLANDS: Amboina: Rant 278 (Bz--25282); C. B. Robinson 304 (Bz--25283). NEW CALEDONIA: Schlechter 15548 [Herb. Hort. Then. I.5998] (Br, S); C. Skottsberg 5 (S). FIJI ISLANDS: Viti Levu: Gillespie 4380 (Bz--25217); A. C. Smith 7088 (Z). AUSTRALIA: Northern Territory: Landsborough s.n. [Gulf of Carpenteria] (Pa). Queensland: Collector undesignated s.n. (Bz--25329). CULTIVATED: Belgium: Lejeune s.n. (Br). Java: Backer 22575 (Bz--25233); Herb. Hort. Bogor. XV.F.50 (Bz--25352), XV.JA.XXXV.1a (Bz--26415), XV.JA.XXXV.2 (Bz-26417, Bz--26418, Bz), XV.JA.XXXV.2a (Bz--26419); Wit s.n. [Herb. Hort. Bogor. XV.JA.XXXV.1] (Bz--26414). New York: New York Bot. Gard. Cult. Pl. 13350 (Ur). Sumatra: Herb. Hort. Bot. Sibolangit 135 (Bz--26515). LOCALITY OF COLLECTION UNDETERMINED: Beumee A.92 (Bz--25257); Collector undesignated s.n. [Archip. Ind.] (Bz--25323, Bz--25324); De V. S. s.n. [Juni 1919] (Bz--25172); Docters van Leeuwen-Reijnvaan s.n. [Saliatiga, 21 Maart 1909] (Bz--25237); Rand s.n. [July 1919] (Bz--25171).

VITEX TRIFOLIA var. SIMPLICIFOLIA Cham., Linnaea 7: 107 [as "β"]. 1832; H. J. Lam, Verbenac. Malay. Arch. 182. 1919.

Synonymy: Vitex rotundifolia L. f., Suppl. Pl. 294. 1781. Vitex ovata Thunb., Fl. Jap. 257. 1784. Vitex repens Blanco, Fl. Filip., ed. 1, 513. 1837. Vitex trifolia β unifoliolata Schau. in A. DC., Prodr. 11: 683. 1847. Vitex trifolia var. unifoliolata Mann, Proc. Am. Acad. 7: 194. 1867. Vitex trifolia γ obovata Benth., Fl. Austral. 5: 67. 1870. Vitex trifolia var. unifoliata Hillebr., Fl. Haw. Isl. 342. 1888. Vitex agnus-castus η ovata Kuntze, Rev. Gen. Pl. 2: 510 & 511. 1891. Vitex trifolia var. ovata (Thunb.) Mak., Bot. Mag. Tokyo 17: 92. 1903. Vitex trifolia var. ovata (Thunb.) Merr., Sp. Blanc. 332. 1918. Vitex trifolia var. repens Ridl., Fl. Malay Penins. 2: 631. 1923. Vitex trifolia var. ovata Mak. apud Degener, Fl. Hawaii. 3: 315: Vitex :Trif.: Ovat., in syn. 1932. Vitex trifolia var. unifoliata Schau. ex J. A. Harris, Physico-chem. Prop. Plant Saps 134, sphalm. 1934. Vitex trifolia var. unifoliolata Schau. ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940. Vitex trifolia var. obovata Benth. ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940. Vitex trifolia var. unifoliolata Hillebr. ex Moldenke, Suppl. List Invalid Names 11, in syn. 1941. Vitex trifolia var. simplicifolia Cham. & Schlecht. ex

Skottsb., Meddel. Göteb. Bot. Trädg. 15: 435. 1944. *Vitex simplicifolia* E. D. Merr., Plant Life Pacific World 282, sphalm. 1945 [not *V. simplicifolia* Oliv., 1875, nor C. B. Clarke, 1885]. *Vitex trifolia* var. *ovata* Thunb. ex Moldenke, Alph. List Invalid Names Suppl. 1: 29, ir syn. 1947. *Vitex ovata* Lam. ex Moldenke, Alph. List Invalid Names Suppl. 1: 29, in syn. 1947. *Vitex rotundifolia* L. ex Beltrán, Cat. Sem. Hort. Bot. Univ. Valentin. 1948: 26, sphalm. 1948. *Vitex trifolia* Hemsl. apud Rehd., Bibliog. Cult. Trees 585, in syn. 1949 [not *V. trifolia* L., 1753]. *Vitex trifolia* var. *unifoliata* DC., in herb. *Vitex trifolia* var. *unifoliolata* DC., in herb.

Literature: Kwa-wi [trans. Savatier], Arbor. 2: pl. 6. 1759; L. f., Suppl. Pl. 294. 1781; Thunb., Fl. Jap. 257. 1784; R. Br., Prodr. Fl. Nov. Holl., ed. 1, 1: 511. 1810; Cham., Linnaea 7: 107. 1832; Hook. & Arn., Bot. Beechey Voy. 206 (1836) and pl. 47. 1841; Blanco, Fl. Filip., ed. 2, 358. 1845; Blanco, Fl. Filip., ed. 1, 513. 1837; Schau. in A. DC., Prodr. 11: 683. 1847; Seemann, Viti 440. 1862; F. Muell., Fragm. 3: 59. 1862; Mann, Proc. Am. Acad. 7: 194. 1867; Benth. & Muell., Fl. Austral. 5: 67. 1870; Blanco, Fl. Filip., ed. 3, 2: 297. 1878; F. M. Bailey, Syn. Queensl. Fl. 379. 1883; Sinclair, Indig. Fl. Hawaii. Isls. pl. 26. 1885; Hillebr., Fl. Haw. Isl. 342. 1888; Hemsl., Journ. Linn. Soc. Lond. Bot. 26: 258. 1890; F. M. Bailey, Cat. Pl. Queensl. 35. 1890; Kuntze, Rev. Gen. Pl. 2: 510 & 511. 1891; Useful Pl. Jap. 2: pl. 447. 1895; Matsumura, Bot. Mag. Tokyo 13: 122. 1899; F. M. Bailey, Queensl. Fl. 4: 1179. 1901; Mak., Bot. Mag. Tokyo 17: 92. 1903; F. M. Bailey in Meston, Exped. Bell-Ker (Parliam. Rep.) 14. 1904; E. D. Merr., Bur. Govt. Lab. Philip. Bull. 6: 17--18. 1904; E. D. Merr., Bur. Govt. Lab. Philip. Bull. 27: 68. 1905; E. D. Merr., Journ. Philip. Sci. Bot. 3: 432. 1908; Matsumura, Ind. 2 (2): 534. 1912; F. M. Bailey, Compreh. Cat. 386. 1913; E. D. Merr., Sp. Blanc. 332. 1918; H. J. Lam, Verbenac. Malay. Arch. 182--183 & 370. 1919; Backer, Trop. Natuur 8: 7, fig. 13. 1919; Nakai, Trees & Shrubs Jap. 1: 350, fig. 190. 1922; Bakh. & Lam, Bull. Jard. Bot. Buitenz., sér. 3, 4 (2): 285. 1922; Ridl., Fl. Malay Penins. 2: 631. 1923; Nakai, Fl. Sylv. Koreana 14: 37, pl. 11. 1923; E. D. Merr., Enum. Philip. Pl. 3: 397. 1923; Mak., Ill. Fl. Jap. [217]. 1924; H. J. Lam in Engl., Bot. Jahrb. 59: 27. 1925; E. D. Merr., Lingnan Sci. Journ. 5: 158. 1927; Nakai, Trees & Shrubs Indig. Jap., ed. 2, 1: 474--475, figs. 224 & 990. 1927; Domin, Bibl. Bot. 22 (89-6): 1114--1115, fig. 181. 1928; Pope, Wayside Pl. Hawaii 196, pl. 111. 1929; Ridl., Disp. Pl. 309. 1930; Stapf, Ind. Lond. 6: 479. 1931; Honda & Sakisaka, Syst. Pl. Japon 362. 1931; P'ei, Mem. Sci. Soc. China 1 (3) [Verbenac. China]: 100. 1932; Degener, Fl. Hawaii. [1: 86] & 3: 315: Vitex: Trif.: Ovat. 1932; Ishidoya, Chines. Drogen 1: 100. 1933; Degener, Fl. Hawaii. fig. 712. 1933; Mak., Gensyoku Yagai-Shokubutsu [Nature Col. Wild Pl.] 4: 300. 1933; Terasaki, Nippon Shokubutsu Zufu [Jap. Bot. Illustr. Album] 712. 1933; Masam., Fl. & Geo. Yakus. 388. 1934; Kanehira, Formos. Trees, ed. 2, 653, fig. 609. 1936; Degener, Fl. Hawaii. 315: Vitex: Trif.: Simp. 1936; H. S.

Marshall, Journ. Soc. Bibliog. Nat. Hist. 1: 69--72. 1937; Fletcher, Kew Bull. 1938: 432. 1938; Corner, Gard. Bull. Straits Settl. 10: 256--260. 1939; Moldenke, Alph. List Common Names 2, 10, 11, 18, & 23. 1939; Dunselman, Trop. Natuur 28: 78, fig. 9. 1939; Moldenke, Geogr. Distrib. Avicenn. 27 & 41. 1939; Kanehira, Formos. Trees, ed. 2, fig. 558. 1940; Moldenke, Prelim. Alph. List Invalid Names 51 & 52. 1940; Rehd., Man. Cult. Trees, ed. 2, 902. 1940; Moldenke, Suppl. List Invalid Names 11. 1941; Worsdell, Ind. Lond. Suppl. 2: 500--501. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39, 53, 55, 57--61, 63--68, 70, 75, & 104. 1942; Moldenke, Alph. List Invalid Names 54 & 55. 1942; D. Fairchild, Gard. Isls. Great East 65. 1943; Skottsb., Meddel. Göteb. Bor. Trädg. 15: 435. 1944; Moldenke, Phytologia 2: 122. 1944; E. D. Merr., Plant Life Pacific World 33, 37, 42, 46, 47, & 274, fig. 46. 1945; Menninger, 1947 Cat. Flow. Trees 24--25. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 29. 1947; Hara, Enum. Sperm. Jap. 1: 190--191. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95, 123, 125, 128, 133--135, 137--140, 142, 145, 146, 148--150, 155, 166, & 203. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Backer & Meeuse, Bekn. Fl., em. ed., 9 (200): 24. 1949; Rehd., Bibliog. Cult. Trees & Shrubs 585. 1949; Biol. Abstr. 28: 3514. 1954.

Illustrations: Kwa-wi [trans. Savatier], Arbor. 2: pl. 6. 1759; Hook. & Arn., Bot. Beechey Voy. pl. 47. 1841; Sinclair, Indig. Fl. Hawaiian Isls. pl. 26 (colored). 1885; Useful Pl. Jap. 2: pl. 447 (colored). 1895; Backer, Trop. Natuur 8: 7, fig. 13. 1919; Nakai, Fl. Sylv. Koreana 14: pl. 11. 1923; Mak., Ill. Fl. Jap. [217]. 1924; Nakai, Trees & Shrubs Indig. Jap., ed. 2, 1: 475, figs. 224 & 990. 1927; Domin, Bibl. Bot. 22 (89-6): 1115, fig. 181. 1928; Pope, Wayside Pl. Hawaii 196, pl. 111. 1929; Honda & Sakisaka, Syst. Pl. Japon. 362. 1931; Degener, Fl. Hawaii. 1: [86] 315: Vitex: Trif.: Ovat. 1932; Ishidoya, Chines. Drogen 1: 100. 1933; Mak., Gensyoku Yagai-shokubutsu [Nature Col. Wild Pl.] 4: 300 (colored). 1933; Terasaki, Nippon Shokubutsu Zufu [Jap. Bot. Illustr. Album] 712. 1933; Degener, Fl. Hawaii. fig. 712. 1933; Degener, Fl. Hawaii. 1: 315: Vitex: Trif.: Simp. 1936; Kanehira, Formos. Trees, ed. 2, 653, fig. 609. 1936; Dunselman, Trop. Natuur 28: 78, fig. 9. 1939; Kanehira, Formos. Trees, ed. 2, fig. 558. 1940; E. D. Merr., Plant Life Pacific World 42, fig. 46. 1945.

This variety differs from the typical form of the species in being usually a low bush or shrub of the seashores with procumbent or creeping stems, rooting at the nodes, and erect branches, its leaves mostly 1-foliolate and sessile or subsessile, the blades being smaller, 1.5--4.5 cm. long and 0.8--3.5 cm. wide, mostly broadly oblong, subrotund, or obovate-spatulate, and rounded at the apex and base or very abruptly short-acuminate, usually remaining densely puberulent above and sometimes velutinous-tomentellous beneath, and the mostly terminal and greatly abbreviated inflorescences.

A low, often prostrate, sprawling, trailing, or creeping shrub, 1--3 m. tall or less, sometimes scandent; stems usually less than 2.5 cm. in diameter, usually several from one root-cluster, usually prostrate or creeping, to 4 m. long, usually abundantly rooting at the nodes for its whole length; wood rather bitter, greenish-white, odorless, soft, with large pith; bark brown, more or less finely shredded; branches usually less than 1 m. long, ascending or erect; branchlets and twigs slender, brownish, acutely or obtusely tetragonal, erect or suberect, often all ascending from one side of the prostrate branches, densely puberulent with sordid or cinereous hairs most conspicuous on the younger parts; nodes annulate; principal internodes 1.5--5 cm. long; leaves decussate-opposite, mostly ascending, normally 1-foliolate, very rarely 2- or 3-foliolate, silvery-green, sessile or subsessile; petioles (when present) slender, 1.5--5 mm. long, usually almost obsolete, convex beneath, flattened and somewhat canaliculate above, densely appressed-puberulent with sordid or whitish hairs, not noticeably ampliate at the base or apex; blades chartaceous, often more or less folded, dark-green and usually brunnescent or nigrescent in drying above, white or grayish beneath, mostly broadly oblong, subrotund, obovate, or obovate-spatulate, 1.5--4.5 cm. long, 0.8--3.5 cm. wide, mostly rounded at the apex and base or very abruptly short-acuminate, or attenuate to the base, entire or sometimes deeply 2- or 3-lobed at the base, densely and usually permanently puberulent above, densely tomentellous-puberulent or sometimes velutinous-tomentellous with white or grayish hairs beneath; midrib very slender, flat and usually more or less canescent above, prominulent beneath; secondaries very slender, 4--12 per side, arcuate-ascending, often branched, flat or subprominulent above, prominulent or hidden by the dense tomentum beneath, not anastomosing; vein and veinlet reticulation sparse, obscure or indiscernible on both surfaces; inflorescence mostly terminal and greatly abbreviated, paniculate, erect, 3--7 cm. long, 2--4 cm. wide, composed of several, opposite, subsessile, 1--3-flowered cymules, cinereous- or sordid-puberulent throughout; peduncles subobsolete, along with the rachis slender, usually acutely tetragonal, similar to the adjacent twigs in color, texture, and puberulence; sympodia usually few and abbreviated; pedicels very slender, about 1 mm. long or less, densely white-puberulent; foliaceous bracts often present in the lower part of the inflorescence, similar to the leaves in all respects, but smaller; bractlets and prophylla linear, 1--3 mm. long, densely white-puberulent; flowers fragrant or odorless; calyx cyathiform, 4--5 mm. long, 2.5--3.5 mm. wide, 5-nerved, very densely white-tomentellous externally, its rim shortly and acutely repand-dentate or the teeth blunt; corolla hypocrateriform, varying from blue, light-blue, blue-lavender, or bluish-lavender to faintly purple, purple, purplish-blue, reddish-purple, pink, or red, sometimes bluish-purple with whitish markings on the anterior lobe, pulverulent or puberulent externally, its tube infundibular, about 12 mm. long, the lower lip expanded into a villous tongue about 6 mm. long, the remaining lobes smaller; stamens and pistil exserted; fruiting-calyx cupuliform, herbaceous, about 5 mm. long and wide, densely cinereous-puberulent on the outside, its rim regularly 5-dentate; fruit drupaceous, at first green, later light-blue, blue, red, or black, globose, about 4 mm. long and wide, very lightly puberulent or strigillose.

This plant is a widespread Asiatic variety native along seacoasts from Mauritius and Bengal through Indochina, Thailand, Pahang, and Singapore, northward to southeastern China, Formosa, Japan, Hongkong, Hainan, and the Lantau Islands, east to the Philippines, Java, Sarawak, the Salajar Islands, New Guinea, the New Hebrides, and the Hawaiian Islands, south to Queensland. It is cultivated in China, Formosa, Hongkong, Germany, and Florida. It is an excellent sandbinder, found abundantly in ravines, along rocky roadsides, on coastal dunes, and along the seashore, fairly common on dry level land in sandy soil, on dry gentle slopes, in meadows and hedges, and on coral sand ridges along beaches. It has been found in anthesis from February through December and in fruit from July to October and in December, but probably flowers and fruits continuously throughout the year in its native haunts. It is cultivated for drug purposes on Honam Island according to McClure, and is used medicinally in the treatment of consumption, according to Ridley. Smitinand states that it is employed locally for medicine in Thailand. In Japan it is often infested by *Cuscuta chinensis* Lam.

The type was collected on sandy shores near Cavite, Luzon, Philippine Islands. In the Linnean Herbarium, London, under genus 811 [790], *Vitex*, specimen number 1 is inscribed "*ovata*" in the handwriting of Smith and "H B" [=Herb. Banks]. It *is* obviously this variety. The Dahl specimen cited below is inscribed "Dahl a Dr. Thunberg" and may be a cotype of *Vitex ovata* Thunb.; the two Thunberg collections (14 and *s.n.*) surely are cotypes of *V.ovata*.

The plant has been misidentified in herbaria as "*Vitex triflora* L.", while the *Baker & Baker 164* distributed as "*Vitex trifolia* var. *ovata*" is actually something apocynaceous and *Baker & Baker s.n.* (Gg—31492) from Japan, also so misidentified, is something in the *Asclepiadaceae*. References in literature to the petioles of this variety attaining a length of 2 cm. refer to specimens that are now called *V. trifolia* var. *heterophylla*, which sometimes also has its leaves all or mostly 1-foliolate.

Skottsberg, in the reference cited above, refers to "Degener, Fl. Haw. 3/7/1938". Heller states that "The hoary under sides of the leaves, and the blue flowers make this a showy species. It is plentiful on the 'barking sands' of Mana, Kauai. The main stems, which are decumbent and quite long, spread out over the sand, sending up branches at intervals of half a foot or less. Horace Mann, Proc. Am. Acad. 7: 194, calls this '*Virtex trifolia*. LINN., var.? *unifoliolata*,' and Hillebrand has it 'var. *unifoliolata*', with no indication that he is not the author of the varietal name. However, it is a *nomen nudum*, as Mann does not describe it, and if it were distinct, would probably have to be called *Vitex ovata* THUNB. My specimens show leaves varying from three-foliolate to entire, some of them being two-lobed. The original spelling in the Species Plantarum is Vitex 'trifoliis', undoubtedly a typographical error."

Fosberg states that on Oahu is forms large low masses, the stems being prostrate with ascending branches and lavender-purple flowers, while Henderson calls it a seashore creeper with mauve flowers in Pahang. Merrill reports that on Luzon the flowers are pale-blue or nearly white, and that the plant has branches 1--2 feet long, ascending from the long creeping stem which roots for its whole length of 8--12 feet. He states that it forms an excellent sandbinder on sandy seacoasts; also "although very distinct in habit, and in its leaves usually reduced to a single leaflet, I doubt very much if it is specifically distinct from the erect Vitex trifoliata Linn." He adds that it is called "lagunding dagat" (lagunding = Vitex trifolia; dagat = ocean), an indication that even the natives recognize the close relationship of this form to the erect form of the species.

Degener says "A shrub forming a large part of the coasta[l] vegetation of all the Islands. Flowering in summer....Widely distributed throughout Polynesia and as far as Japan and India on coastal dunes. Notably in the Philippines Vitex trifolia L., a trifoliate shrub or small tree, grows inland; the unifoliolate variety grows along the shore. There is some evidence that the latter when grown inland will develop into the typical species, and would hence be but an ecovariety. According to Ridley Fl. Malay Pen. p. 631, speaking of V. trifolia and V. trifolia var. repens [simplicifolia?], 'The two forms look so utterly unlike that they might be easily taken for two species, but the sea-shore form taken inland soon becomes the tree form.' Whether this statement also applies to the Hawaiian plant is worth investigating. A single clump of these plants growing some distance from the coast near Kamalo, Molokai, were essentially the same as those growing nearer shore."

Domin says "An der Küste in der Nähe der Russell-Mündung (Domin I. 1910), in Gesellschaft der V. trifolia, von dieser jedoch schon habituell durch den Wuchs gänzlich verschieden und durch keinerlei Übergänge verbunden." Meeuse, in a letter to me dated December 9, 1953, also feels that it should have specific rank. He says "Several botanists who spent some time in the Indies, among them the well-known and celebrated Dr. C. A. Backer, have told me that the form with unifoliolate leaves is (1) a coastal form growing on sandy dunes, (2) prostrate and always (3) unifoliolate, and that typical V. trifolia is (1) found far inland, (2) erect and (3) always trifoliolate. Ridley...mentions that the creeping coastal form soon changes into the shrubby form inland, but Dr. Backer, who as you know is almost unrivalled as a collector and student of the Javanese flora, says: 'Never! They are two distinct forms and there are no intermediate specimens.' Therefore, in the tentative Flora of Java I retained it as a well-defined species, on ecological as well as on morphological grounds, as Vitex ovata Thunb. I have never seen any intermediate specimens myself and think Ridley's remark is another of his little lapses. V. ovata must be a good species."

Merrill, in the 1904 publication cited above, says under V. ovata: "This widely distributed species is apparently distinct from V. trifoliata L. f. to which it has been reduced by various authors. It is represented in our herbarium by No. 323, Aparri, Province of Cagayan, Luzon, June 22, 1902, and No. 898, Calapan, Mindoro, 1903. At both of these localities the trailing form only was found. On Lubang Island, however, in April, 1903, this form was found associated with V. trifoliata L. f., and no intergrading forms were observed. V. trifoliata L. f. was always an erect shrub, 2 to 3 m. high, with trifoliate leaves, while V. ovata Thunb. was always trailing, and with simple ovate or obovate leaves. Vitex ovata Thunb. is found on sandy sea beaches, where it is a valuable sand-binder, trailing 3 to 4 m., the stem rarely exceeding 1 cm. in diameter, and sending up numerous erect branches 1 to 6 dm. in length. No one seeing the two forms growing together would confuse them, as they appear very distinct. Tagalog, Lagunding gapang."

Dr. Lam uses the varietal name "unifoliolata" for this taxon with the comment "Wir haben Schauers Varietäten beibehalten - obgleich diejenigen Chamissos die Priorität besitzen - weil sie die richtigsten sind." Instead of "most correct" he obviously means "most appropriate", because under the International Rules of Botanical Nomenclature they are not the correct names to be used. In his 1919 publication he says "Properly speaking Chamisso's variaties have the priority, but we retain those of Schauer, the names being the most exact." Whether an epithet is descriptively accurate or not has no bearing whatever on its legality under the Rules. If we changed the names of our plants and animals because other names would be more accurately descriptive, we would be changing names continuously and there would be no hope of nomenclatural stability. As an example of what would happen we need only consider the works of Richard Anthony Salisbury! Chamisso's name is the first to have been applied validly to this taxon in the varietal category and is therefore the one that must be employed if we consider the taxon to be a variety.

Dr. Van Steenis, in a letter to me dated October 4, 1956, states that he regards the plant as worthy of subspecies status and that he plans to re-name it in this category in his forthcoming book on Malaysian vegetation. "After work in the Herbarium and taking notice of the literature I agree fully with you that it does deserve distinction but that this should be in the infraspecific level. It is clearly of (ecotypical) racial rank, but genetically defined and not a mere phaenotypical thing. In our Flora we are following the practice of discriminating between variety and subspecies in the way a great number of taxonomists have interpreted these infraspecific taxa, viz: subspecies for any partial population, that is a part of a species population which is geographically or ecologically defined, respectively has its own area of distribution and/or ecology (e.g. a mountain race, or littoral race, or ecologically a swamp race, etc.); *variety* for all other deviating paramorphs worthy to distinguish." On this basis he concludes that our plant should receive designation as a subspecies, and doubtless it will have to be thus treated in the forthcoming discussion of the family which I am preparing for the Flora Malesiana. However, I personally do not approve of the use of "subspecies", nor of the dozens of other categories which certain taxonomists now are proposing for recognition in the scientific names of plants and animals. In my opinion it is not advisable to attempt to indicate too muchin the name of an organism. If we continue in this trend the names of organisms will become the cumbersome polynomials from which the binomial system of Linnaeus attempted to free us. For this and other reasons I do not adopt the trinomial system with its silly repetition of the specific name. If any name can be more ridiculous than *Cardinalis cardinalis cardinalis* or *Bison bison bison*, I hope I never see it! Similarly, placing "subsp.", "clon", "subform", "ecotype", etc., and also an "x" or "+" within the scientific name of a plant tends to be more confusing to the average reader and user of these name than it is worth. Let us go back to the Linnean concept of having a name merely as a handle for the recognition of a plant or animal population and let us not try to indicate too much else as to our opinions about the genetic or other history or constitution or relationship of the population *in the name*. Names are not for that purpose. "Variety" and "form" are, *in my* opinion, sufficient infraspecific categories for nomenclatural use. I use "variety" in the sense that Van Steenis uses "subspecies", and I use "form" in the sense of his "variety".

Lam cites *Ari Kotara s.n.* from Chichigunu, Okasawara, in the Bonin Islands, a collection not yet seen by me. He also records the variety from Réunion, Ceylon, Malacca, and the Andaman Islands. He cites *Horsfield s.n.* (Ut--49902) from Java and Docters van *Leeuwen-Reijnvaan 1863* from the Salajar Islands -- the latter said to be "partly an erect shrub, partly a characteristic, creeping shore plant." Seeman, in the reference cited above, refers to his *no. 354* as "V. *trifolia* Linn." from the Fiji Islands. The *McClure 639* specimen in the Langlois Herbarium shows stems rooting at the nodes. *Heller 2731* at the University of Michigan shows the twigs all ascending from one side of the procumbent branches. Degener's illustration shows a 3-foliolate leaf. The *Bijhouwer 173* specimen cited below exhibits a few 3-foliolate leaves, all with characteristic abbreviated or subobsolete petioles, enabling one to distinguish them at a glance from the 3-foliolate leaves of var. *heterophylla* and from the typical form of the species. Tsang describes the plant as "erect, 1 m. tall", but it is most probable that he refers here to the erect branches from prostrate stems.

There is some doubt as to the exact identity of Kuntze's *Vitex agnus-castus* var. *subtrisecta*. The specimens from the type locality cited by Kuntze -- Willisgebirge, Java -- seem to be typical

V. trifolia, but another specimen in the Britton Herbarium on which Kuntze actually wrote his original diagnosis of var. *subtrisecta* and which was collected "cult. Sindangbaja" and is not cited by him at all in his publication, is a mixture of *V. trifolia* and its var. *simplicifolia*. The type was collected at 2000 feet altitude and the other material at 3500 feet. If so, it seems most probable that the portion which is var. *simplicifolia* is an extraneous mixture added from a seacoast station by error. If this is not the case and if the material now on this sheet did actually come from the same plant growing at 3500 feet altitude, it would be excellent proof that the variety is actually an eco-variety as suggested by Degener and Ridley.

The material employed by Harris in his experiments on the physico-chemical properties of plant saps was collected on low coral sand dunes along the shore of Waimanalo Bay, Oahu, and is cited below under his collection numbers. Menninger states (1946) that the Fairchild Tropical Garden has distributed this variety propagated from seed collected by Dr. Fairchild "on a beach in the south seas". Dr. Fairchild actually says in the work cited above (1943) "I was disappointed not to find more interesting plants on the dunes [of Ilcas Norte]; but one lavender-flowered shrub with fragrant, entire leaves seemed attractive, and Conicosa and I gathered the few seeds we could find. It is *Vitex trifolia*, var. *ovata*, and it appears to be making an unusual record where it is growing in the Fairchild Garden, adding another desirable shrub to the rather meager list of plants that will grow near the sea."

Common names recorded for this variety are "agubarau", "beach vitex", "daldaláki", "dancundi", "danglá-ti-baybai", "dunglá", "kolokolo kahakai", "lagondi", "lagundi", "lagundí-dágat", "lagunding dagat", "lagunding gapang", "lagundíng-gapáng", "paak pui ip", "paak pui man king", "pak-muk-ying", "polinalina", "si saw", "so pa", and "vulokaka".

Citations: BRAZIL: Rio de Janeiro: *Wallis s.n.* (B). CHINA: Chekiang: *Chiao 14644* (Go); *Ching 1967* (Ba). *Fukien 2224* (Bz--25223). Hopeh: *M. K. Clemens 6363* (Br, Br, Br, Br). Kwangtung: *F. A. McClure 639* [Canton Chr. Coll. 7425] (I, Mi--photo, N); *s.n.* [Herb. Lingnan Univ. 13095] (I, N, N); *W. T. Tsang s.n.* [Herb. Lingnan Univ. 16649] (I, N, N). Shantung: *Chiao 2774* (N, N); *F. N. Meyer 328* (Ar--19793), *380* (Du--13533). Province undetermined: *Krons s.n.* (S). HONAM ISLAND: *F. A. McClure 58*, in part (Ar--11240). FORMOSA: *Oldham 382* (C, S); *Sasaki s.n.* [Herb. Govt. Formosa 21595] (La, S); *T. Tanaka 5355* (N); *Yamamoto 2380* (N). JAPAN: Honshiu: *Makino s.n.* [Rikuzen, 1899] (Bl--42353); *Maries s.n.* [Nikko] (Pa); *Y. Matsumura 5910* (N), *6020* (N); *Maximowicz s.n.* [Yokohama, 1862] (Br, S); *Sasaki & Togasi 606* (N). Kiushiu: *Maximowicz s.n.* [Nagasaki, 1863] (C); *Oldham 626* (S); *T. Tanaka 100.7* [406.7] (N). Island undetermined: *Bunge s.n.* (M); *Collector undesignated s.n.* [Tozumi, 30/9/95] (S); *Herb. Ames s.n.* [30 Jul.

(Oa); Herb. Lugd.-Bat. s.n. (S); Herb. Sci. Coll. Imp. Univ. s.n. [Ise; Aug. 16, 1889] (Vt); Thunberg s.n. [Japan] (N--photo, S, Z-photo); Uno E.30 (Mi). MACAO: Meyen s.n. [8/31; Herb. Prager 18674] (Gg--31481). HONGKONG: W. Y. Chun 6552 (Du--200917); Dahlström 52 (S); Ford s.n. (N); Fortune 90 (S); Milford s.n. [Hong Kong] (Pa); C. Wright s.n. (T). LANTAU ISLANDS: F. A. McClure s.n. [Herb. Lingnan Univ. 13095] (N, S). LAPPAS ISLAND: Vachell s.n. [17 July 1830] (Br). HAINAN ISLAND: How 73817 (Bz--25222); Lei 1087 (N), 1093 (N); Liang 62926 (N, S), 64027 (N); C. Wang 33826 (N), 34847 (N), 34899 (N). INDOCHINA: Annam: Clemens & Clemens 3028 (Gg--156759, Mi, N, Ut--254a). PHUQUOC ISLAND: Pierre s.n. [2/1874] (S). THAILAND: Smitinand 1458 [Herb. Roy. Forest Dept. 6840] (Z). MALAYA: Pahang: Corner s.n. [Herb. Bot. Gard. Singapore 25784] (N): M. R. Henderson 18415 (Bz--25216); Nur 21758 (Bz--25226). Singapore: N. J. Andersson s.n. [Singapore, 28 Jan. 1853] (S). LIUKIU ISLANDS: Okinawa: Conover 947 (W--1993131); Field & Loew 210 (W--1942624); Koidzumi s.n. [V.1923] (W--2071018); Walker, Tawada, & Amano 5781 (W--2093196), 5868 (N), 6009 (W--2093401), 6028 (N). BONIN ISLANDS: Herb. Torrey s.n. (T). PHILIPPINE ISLANDS: Luzon: N. J. Andersson s.n. [Jan. 1853] (S); H. M. Curran s.n. [Herb. Philip. Forest. Bur. 5968] (Bz--25353); Escritor s.n. [Herb. Philip. Bur. Sci. 21171] (Cm); R. Kienholz s.n. (Ur); Madarang s.n. [Gates 8493] (Ka--64770); R. C. McGregor s.n. [Herb. Philip. Bur. Sci. 10072] (Br); E. D. Merrill 323 (Bz--25350, N), Sp. Blanc. 814 (Bz--25354, N); D. D. Wood s.n. [Herb. Philip. Forest Bur. 13069] (Gg--31484). Mindoro: Mangubat s.n. [Herb. Philip. Bur. Sci. 926] (Bz--25352, N); E. D. Merrill 898 (N). Panay: R. C. McGregor s.n. [Herb. Philip. Bur. Sci. 32477] (Bz--25349). Sibuyan: A. D. E. Elmer 12135 (Bz--25351, N, Ut--29235, Vt). Island undetermined: Née 30 (Q), 46 (Q), 47 (Q), 48 (Q), 53 (Q). MADURA ISLAND: Backer 19583 (Bz--25343, Bz--25344, Bz--25345), 19976 (Bz--25338, Bz--25339, Bz--25340, Bz--25341), 21226 (Bz--25342, Bz--25675); Rant s.n. [28.XII.1924] (Bz--25337). JAVA: Backer 2880 (Bz--25332, Bz--25333, Bz--25334, Bz--25335, Bz--25336), 19583 (Bz--25680); Bijhouwer 173 (Bz--25174); Collector indig. s.n. [1920] (Bz--24483). ANAMBAS ISLANDS: Temaja: M. R. Henderson 20462 (Bz--25224). SARAWAK: Hose 267 (Ph). BORNEO: Dunselman 59 (Bz--72796); Polak s.n. [1-7-1949] (Bz--26602). LESSER SUNDA ISLANDS: Banka: Anta 359 (Bz--72689); Berkhout 502 (Bz--25356); Teijsmann s.n. [Muntok] (Bz--25355). Kisar: Bloembergen 3894 (Bz--72654). Savoe: Bloembergen 3291 (Bz--72655, Bz--72656). MOLUCCA ISLANDS: Mangole: Atjeh 213 (Bz--25346, Bz--25347). NEW GUINEA: Dutch New Guinea: J. W. R. Koch s.n. (Bz--25348). Papua: Reedy s.n. [Katau River] (Mb). HAWAIIAN ISLANDS: Kauai: Fosberg 12734 (Du--292997); A. A. Heller 2731 (C, Mi, N).

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NOTES ON BROMELIACEAE, IX

Lyman B. Smith

COSTA RICA

VRIESIA WILLIAMSII L. B. Smith, sp. nov.

A V. viride (Mez) Smith & Pittendrich, cui affinis, laminis foliorum angustioribus pulchre longitudinaliter purpureo-lineatis, petalis subduplo majoribus differt.

Apparently stemless but the extreme base lacking, flowering plant 8 dm. long with the inflorescence extended; leaves suberect, 4 dm. long, sparsely and minutely appressed-lepidote, sheaths elliptic, 10 cm. long, dark castaneous except near apex, blades narrowly triangular, acuminate, 2 cm. wide at base, longitudinally marked with fine purple stripes; scape slender, apparently decurved, glabrous; scape-bracts erect, subfoliaceous, much exceeding the internodes; inflorescence bipinnate, lax, 14 cm. long; primary bracts broadly ovate with a narrowly triangular spreading or recurved blade, the lower ones exceeding the flowers; branches 2-flowered, the axis almost completely aborted; pedicels stout, 3 mm. long; sepals elliptic, obtuse, 18 mm. long, 11 mm. wide, ecarinate, coriaceous; petals 45 mm. long, appendaged at base. Pl. I, fig. 1: Branch x 1; fig. 2: Sepal x 1.

Type in the U. S. National Herbarium, No. 2,249,525, collected on trees in cloud forest near "El Jardin," Cerro de la Muerte, Cordillera de Talamanca, Province of Cartago, Costa Rica, altitude 2700 meters, May 20, 1956, by Louis O. Williams (No.20240a).

ECUADOR

TILLANDSIA CUCULLATA L. B. Smith, sp. nov.

A T. secunda H. B. K., cui affinis, foliorum vaginis multo majoribus, laminis ligulatis, ramorum basibus sterilibus brevibus nudis, bracteis florigeris obovatis cucullatisque differt.

Stemless, to 3 m. high; leaves to 65 cm. long, sheaths broadly elliptic, 30 cm. long, pale brown, covered with appressed cinereous brown-centered scales, blades ligulate, subacute, apiculate, 10 cm. wide, flat; inflorescence bipinnate with about 40 branches; axis stout; primary bracts broadly ovate, apiculate, exceeding the short naked sterile bases of the branches; spikes spreading, densely many-flowered, 16 cm. long, geniculate; floral bracts imbricate, scarcely if at all secund, obovate, cucullate, 30 mm. long, obscurely carinate, coriaceous and faintly nerved when dry, probably fleshy in life, bright yellow, obscurely pale-lepidote; flowers downwardly secund; pedicels broad, flattened, biangulate, 10 mm. long; sepals free, obovate, obtuse, 25 mm. long, subcoriaceous, nerved, green, carinate toward base, broadly convex above, obscurely pale-lepidote; petals naked, barely exceeding the sepals, the lower half white, the upper deep purplish blue; stamens included. Pl. I, fig. 3: Branch x 1/2; fig. 4: Sepal x 1.

Type in the U. S. National Herbarium, Nos. 1,987,734 and 1,987,735, collected on trees, 1-8 km. north of the village of Sevilla de Oro, eastern Cordillera, Province of Azuay, Ecuador, altitude 2400 to 2700 meters, July 27-August 12, 1945, by W. H. Camp (No. E-4592).

The above collection was erroneously reported as Tillandsia secunda H. B. K. in "Plants collected in Ecuador by W. H. Camp" (Mem. N. Y. Bot. Gard. 8: 29. 1952).

PERU

VRIESIA CEREICOLA (Mez) L. B. Smith, comb. nov.
Tillandsia cereicola Mez in Fedde, Rep. Nov. Spec. 3: 34. 1906.

CAJAMARCA: Jaén: Woods near Jaén, alt. 700 m., Aug. 1956, Rauh P-331 (US, small-flowered form). ANCACHS: Open ground, near Caraz, alt. 2200 m., Weberbauer 3025 (B, type; F phot. 11487). Valley of the Rio Santa, alt. 2000 m., Aug. 1956, Rauh P-270 (US).

In the absence of the type it is necessary to judge the species on the basis of Rauh P-270 which is a very close match for the photograph and description of the type and comes from near the type locality. Mez gives no indication of having dissected a flower, apparently assuming that it had the characters of a Tillandsia. However, both Rauh P-270 and P-331 show well developed appendages at the base of the petal.

VRIESIA RAUHII L. B. Smith, sp. nov.

A V. lopezii L. B. Smith, cui valde affinis, spicis laxioribus, sepalis minoribus obtusis differt.

Flowering plant 6 dm. high; leaves erect, 38 cm. long, covered with minute gray closely appressed scales, sheaths triangular-ovate, 6-8 cm. long, dark castaneous, blades linear-triangular, 2 cm. wide, green; scape curved, slender, glabrous; scape-bracts erect and closely enfolding the scape, imbricate, elliptic, apiculate, red, lepidote, thin; inflorescence few-branched, digitate, 38 cm. long; primary bracts like the scape-bracts, 4 cm. long, much shorter than the densely bracteate sterile bases of the branches; branches suberect, flexuous, slender, shallowly excavated next the flowers; floral bracts erect, slightly longer than the internodes and exposing much of the rhachis, exceeding the sepals, 27 mm. long, ecarinate, the apex nerved and densely pale-lepidote, elsewhere even and glabrous, subcoriaceous; sepals elliptic, obtuse, 18 mm. long, ecarinate; petals imperfectly known, much exceeding the sepals, dark violet, bearing 2 large oblong scales at base; stamens probably exserted. Pl. I, fig. 5: Section of spike x 1; fig. 6: Sepal x 1.

Type in the U. S. National Herbarium, No. 2,251,107, collected in woods near Jaén, Province of Jaén, Department of Cajamarca, Peru, altitude 700 meters, September 2, 1956, by W. Rauh (No. P-330).

At first glance Vriesia rauhii would appear to differ from V. lopezii in its digitate inflorescence, but further material received from Dr. López-Miranda shows that the latter species has both simple and digitate inflorescences.

BOLIVIA

PUYA LAXA L. B. Smith, sp. nov.

P. spathacea Grisebach in systema Mezii (Pflanzenreich IV. Fam. 32: 285) proxima sed ramorum gracillimorum basibus sterilibus plerumque quam bracteis primariis integris subduplo longioribus differt.

Flowering shoot 8 dm. high (! Cardenas); leaves (only the inner known) at least 27 cm. long, sheaths suborbicular, 3 cm. long, glabrous toward base, densely serrulate toward apex, blades narrowly triangular, caudate-acuminate with a long entire apex, laxly serrate below with slender antrorse brown spines 5 mm. long, densely tomentose with coarse white scales especially beneath; scape 4 mm. in diameter, mostly exposed, soon glabrous; scape-bracts ovate, thin, the lower ones with small foliaceous blades, the upper merely acuminate, entire, much shorter than the internodes; inflorescence laxly bipinnate, soon glabrous except for the white-puberulent pedicels; primary bracts broadly ovate, apiculate, entire, to 25 mm. long, thin, mostly about half as long as the sterile bases of the branches; branches spreading, straight, very slender, lax, the lateral ones to 23 cm. long; floral bracts broadly ovate, apiculate, to 13 mm. long, slightly exceeding the pedicels, membranaceous; flowers dark violet (! Cardenas), not noticeably secund; pedicels slenderly cylindric; sepals lance-oblong, apiculate, 17 mm. long, thin, sulcate, slightly carinate at base; petals 30 mm. long, naked. Pl. I, fig. 7: Base of branch x 1; fig. 8: Sepal x 1.

Type in the U. S. National Herbarium, Nos. 2,250,651 and 2,250,652, collected on dry stony soil near Pulquina, Department of Santa Cruz, Bolivia, altitude 1500 meters, December 1955, by M. Cardenas (No. 5092).

BRAZIL

AECHMEA DEALBATA E. Morr. ex Baker, Handb. Bromel. 58. 1889.
Aechmea fasciata sensu L. B. Smith in part, Bromeliaceae of Brazil, Smithsonian Misc. Coll. 126: 216. 1955.

Bracts brown with persistent white indument; scape-bracts nearly all imbricate; inflorescence ellipsoid and simple or narrowly pyramidal; petals coral red at anthesis. Pl. I, fig. 10: Inflorescence x 1/2.

BRAZIL: Cultivated, no further locality, E. Morren, Sept. 1879 (K, type, an unpublished plate); E. Morren, May 1885 (LG, GH phot.); M. B. Foster 2895 (US); Montreal Bot. Gard. IV (US).

The nearly related Aechmea fasciata (Lindl.) Baker has pale rose bracts with deciduous white indument, only the highest scape-bracts imbricate, the inflorescence broadly pyramidal and compound, and the petals pale blue at anthesis. Pl. I, fig. 9: Inflorescence x 1/2.

Plate I

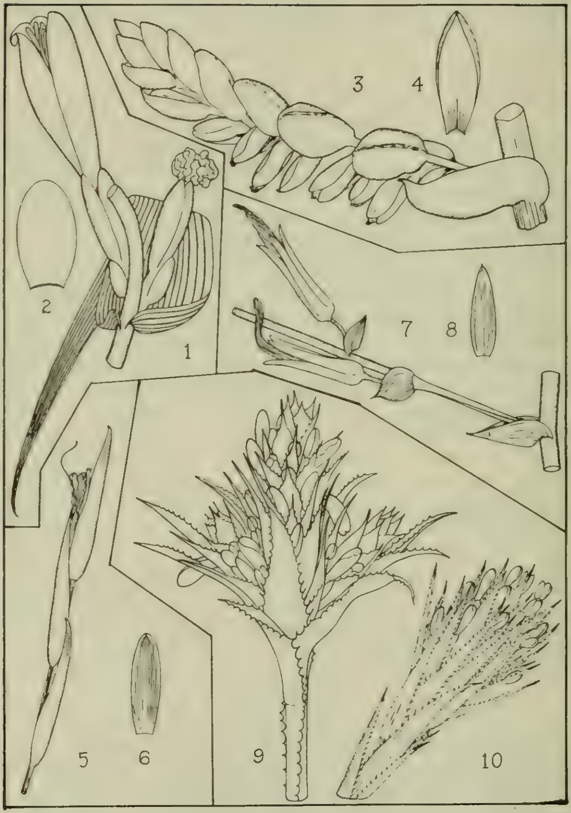

Fig. 1, 2: Vriesia williamsii; fig. 3, 4: Tillandsia cucullata; fig. 5, 6: Vriesia rauhii; fig. 7,8: Puya laxa; fig. 9: Aechmea fasciata; fig. 10: Aechmea dealbata.

MATERIALS TOWARD A MONOGRAPH OF THE GENUS VITEX. XI

Harold N. Moldenke

VITEX TRIFOLIA var. SIMPLICIFOLIA Cham.

Citations: HAWAIIAN ISLANDS: Kauai: A. A. Heller 2731 (Mi—photo); Saint John, Hosaka, Hume, Inafuku, Lindsay, Mitchell, & Wong 10841 (Gg); C. Skottsberg 1059 (Go). Lanai: Munro 90 (Bz—25360). Maui: Mann & Brigham 409 (It, Ms, N, Pa); Topping s.n. [Degener 9504] (I, Ms, N). Molokai: Degener 9506 (Gg—267592, Ms, N), 9507 (N). Oahu: Degener 10018 (I, N), H.20 (Ms, N), H.226 (N), s.n. [April 8, 1923] (Gg—267594); Fosberg 10360 (Du—239418, En), 27125 (Ew); H. Hapeman s.n. [Waialua, May 1, 1908] (Hp, Mi, Ur); J. A. Harris C.242140 (Go, N), C.242201 (Go, N); Herb. Oahu College 64 (Mi); Lyons s.n. [Waikiki, March 1889] (H—106471); Selling 3714 (Go, S); C. Skottsberg 235 (Go, S). Island undesignated: J. F. C. Rock 48 (N), 50 (Ba); Wilkes s.n. [U. S. Expl. Exped., Sandwich Isls.] (T). NEW HEBRIDES: Aneityum: Kajewski 690 (La, N). AUSTRALIA: Queensland: E. Betche s.n. [8.1901; Herb. Prager 20488/2265] (Gg—31485, Na—18564); Collector undesignated 10 (S); Michael 1018 (Bz—25237); F. Mueller s.n. [Rockingham Bay] (Bz—25358); C. T. White 8957 (N, N). THURSDAY ISLAND: Henne s.n. (Bz—25359). SOCIETY ISLANDS: Tahiti: Sparrman s.n. (S). CULTIVATED: China: Hom A.387 [Herb. Lingnan Univ. 18794] (N). Germany: Döllinger s.n. [Herb. Acad. Herbip.] (Mu--685); Herb. Hort. Bot. Berol. s.n. [1827] (B). Hongkong: Herb. Hongkong Bot. Gard. s.n. (S). Java: Herb. Hort. Bot. Bogor. XV.F.50 (Bz—26351), XV.JA.XXXV.1 (Ba), XV.JA.XXV.1a (Bz—26416); Kuntze 4445, in part (N). Netherlands: Herb. Hort. Bot. s.n. (Ut--49902). Queensland: Flecker 13908 (Le). LOCALITY OF COLLECTION UNDETERMINED: Dahl s.n. (S); Henry s.n. [Deep Water Bay, 21-6-97] (N); Herb. Linnaeus G.811, S.1 (Ls, N--photo, Z--photo); Herb. Swartz s.n. (S); Herb. Tjibodas s.n. (Bz—26506); Thunberg 14 (S); Wallis s.n. [Herb. Reichenbach f. 129054] (V). MOUNTED ILLUSTRATIONS: Ferd. Bauer Icon. Nov. Holl. 967 (V), 967a (V), s.n. (V).

VITEX TRIFOLIA var. SIMPLICIFOLIA f. ALBIFLORA (Y. Matsumura) Moldenke, Phytologia 2: 477. 1948.

Synonymy: Vitex rotundifolia var. albiflora Y. Matsumura, Amatores Herbarii 10: 54. 1943.

Literature: Y. Matsumura, Amatores Herbarii 10: 54. 1943; Moldenke, Phytologia 2: 477. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 134 & 203. 1949.

This form differs from the typical form of the variety in having its corollas white.

Citations: JAPAN: Honshiu: Y. Matsumura 6001 (N).

VITEX TRIFOLIA var. VARIEGATA Moldenke, Phytologia 2: 31. 1941.

Literature: Moldenke, Phytologia 2: 31. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 104 (1942) and [ed. 2], 166 & 203. 1949.

This variety differs from the typical form of the species in having the leaflets variegated with whitish spots in irregular mottles along and near the edges.

The type of the variety was collected by Walter M. Buswell from cultivated material at or near Miami, Dade County, Florida, in 1940, and is deposited in the L. H. Bailey Hortorium at Cornell University. I have personally seen the variety grown as a hedge at Key West, Monroe County, and on Sanibel Island, Lee County, Florida.

Citations: CULTIVATED: Florida: *Buswell s.n.* [So. Florida, 1940] (Ba—type, N—photo of type, Z—photo of type), *s.n.* [Miami, Aug. 21, 1941] (N); *P. O. Schallert 23077* (Je—8832). New York: *C. Pecora s.n.* [Aug. 8, 1949] (N), *s.n.* [Oct. 21, 1949] (N). Bahamas: *Howard & Howard 10295* (N).

VITEX TRIPINNATA (Lour.) Merr., Trans. Am. Phil. Soc., new ser., 24 (2): 335. 1935.

Synonymy: *Tripinna tripinnata* Lour., Fl. Cochinch. 391. 1790. *Tanaecium tripinna* Raeusch., Nomencl. Bot., ed. 3, 178, nom. nud. 1797. *Tripinnaria cochinchinensis* Pers., Syn. Pl. 2: 173. 1806. *Tripinnaria asiatica* Spreng., Syst. Veg. 2: 842. 1825. *Tripinnaria tripinnata* Steud., Nom. Bot., ed. 2, 2: 712. 1841. *Colea tripinnata* Seem., Bonplandia 4: 128. 1856. *Vitex leptobotrys* H. Hallier, Meded. Rijks Herb. Leid. 37: 48—49. 1918. *Vitex annamensis* Dop, Bull. Soc. Hist. Nat. Toulouse 57: 204—204. 1928. *Vitex leptobothrys* H. Hallier ex Moldenke, Alph. List Invalid Names 53, in syn. 1942.

Literature: Lour., Fl. Cochinch., ed. 1, 391 (1790) and ed. Willd., 476. 1793; Raeusch., Nomencl. Bot., ed. 3, 178. 1797; Pers., Syn. Pl. 2: 173. 1806ç Spreng., Syst. Veg. 2: 842. 1825; Steud., Nom. Bot., ed. 2, 2: 712. 1841; Seem., Bonplandia 4: 128. 1856; Baill., Bull. Soc. Linn. Paris 1: 714. 1888; Jacks., Ind. Kew. 1: 582 (1893) and 2: 1121. 1895; H. Hallier, Meded. Rijks Herb. Leid. 37: 48—49. 1918; Moore, Journ. Bot. 63: 286. 1925; Dop, Bull. Soc. Hist. Nat. Toulouse 57: 203—204. 1928; E. D. Merr., Trans. Am. Phil. Soc., new ser., 24 (2): 335. 1935; Dop in Lecomte, Fl. Gén. Indo-chine 4: 811 & 848. 1935; Hill, Ind. Kew. Suppl. 9: 298. 1938; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 59 & 104. 1942; Moldenke, Alph. List Invalid Names 52 & 53. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 137 & 203. 1949.

Illustrations: Dop in Lecomte, Fl. Gén. Indo-chine 4: 811 & 848. 1935.

Tree, 7—8 m. tall; branchlets rounded, glabrous; bark gray, striate; leaves 3-foliolate; petioles slender, canaliculate, glabrous; leaflet-blades subcoriaceous or chartaceous, broadly obovate or almost rhomboid, varying to rounded, 5--6.5 cm. long, 3--5 cm. wide, obtuse or abruptly short-acuminate at the apex, entire, attenuate (on the central ones) or rounded and inequilateral (on the lateral ones) at the base, glabrous on both surfaces but scabrous and glandulose above, shiny, the young ones yellow in drying; secondaries slender, 10--14, slightly recurved at the margins; veinlet reticulation inconspicuous; petiolules 2--4 mm. long on lateral leaflets and 6--12 mm. long on central ones; inflorescence paniculate, terminal, glabrous, lax, few-flowered, subsessile, the branches opposite and brachiate, the cymules dichotomous and 2-flowered; peduncles 5--6 mm. long; pedicels slender, 5--10 mm. long; bracts and bractlets very small, firm, acute at the apex; flowers about 10 mm. long, odorous; calyx campanulate, about 3 mm. long, glabrous but glandulose on the outside, the rim 5-lobed, the lobes triangular, about 1 mm. long, obtuse at the apex; corolla yellowish or yellowish-white, its tube glabrous on the outside, somewhat hairy at the insertion of the stamens within, about 5 mm. long, the limb pubescent on the outside, the upper lip 2-lobed, the lobes linear, 2--3 mm. long, glabrous within, the lower lip with its middle lobe about 4 mm. long and slightly pilose at the base within; stamens scarcely exserted; style thickened at the base, equaling the stamens; stigma bifid; ovary glabrous; fruit drupaceous, black, rounded, 5--6 mm. in diameter.

The species is based on a Loureiro collection from "sylvis montanis Cochinchinae" Baillon, in the reference cited above, states that the Loureiro specimen preserved in the herbarium of the British Museum is a species of Vitex and very near, if not identical with numerous specimens collected by Pierre in Indochina. Moore later confirmed this and asserts that Loureiro's type may be conspecific with Pierre 1864. Loureiro apparently erred in describing the fruits of his plant as many-seeded and the leaves as tripinnate. He probably meant to say trifoliate, because the leaves of his type specimen are trifoliate. These 2 erroneous characters led Seemann to place Tripinna Lour. in the Bignoniaceae. The rather long list of synonyms, based on what was to the authors proposing them, an unknown species or, at least, one known only from Loureiro's incomplete and inaccurate description, illustrates the mistakes that can be made when the original type specimens are not examined.

Vitex annamensis was based on Poilane 2765 from near Nhatrang in the Massif du Co Hin and on Poilane 5582, 8555, and 12560 from Ca Na in the province of Phanrang, Indochina. The type of V. leptobotrys is Balansa 3815, collected in woods at Tu-Phap, Tonkin, in May, 1887. The binomials proposed by Persoon, Sprengel, Steudel, and Seemann, cited above, were all based on Loureiro's binomial.

The species is said to be a common tree in open places along rivers, and a shrub along trails, blooming from May to July. The flowers are said to be yellow or red. Herbarium material has been misidentified as Cornutia quinata Lour. and Vitex quinata (Lour.)

F. N. Will. Common names are "cây den" and "sa khang".

Citations: HAINAN ISLAND: How 72997 (Bz--23804). INDOCHINA: Annam: Clemens & Clemens 3394 (N, Ut--104a); Poilane 17 (N), 17901 (N). Cambodia: Béjand 223 (N). Tonkin: Pételot 5869 (Bz--23803, Er), 6080 (N), 6398 (Bz--24247, N), 6419 (Bz--24248, N), 6853 (N). Laos: Vidal 2201 (Z). THAILAND: Pierre 79 (Bz--72847).

VITEX TRISTIS S. Elliot, Journ. Linn. Soc. Lond. Bot. 29: 42. 1891.

Literature: S. Elliot, Journ. Linn. Soc. Lond. Bot. 29: 42. 1891; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 76, 78, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104 (1942) and [ed. 2], 123 & 203. 1949.

Large tree; branchlets and twigs slender, gray-brownish, very obtusely tetragonal or subterete, the younger parts glaucescent and very smooth and shiny, the very youngest parts appressed-pilose with short antrorse hairs, soon glabrescent; nodes not annulate; principal internodes 1--4 cm. long, mostly abbreviated; leaf-scars rather large, sunken, not conspicuously prominent; leaves decussate-opposite, 1-foliolate; petioles slender, 6--21 mm. long, sparsely pilosulous when young, soon glabrescent, often glaucescent, especially at the base, flattened and canaliculate above; blades subcoriaceous, uniformly dull-green on both surfaces, oblong or elliptic, 3--10.5 cm. long, 1.2--4.5 cm. wide, regularly emarginate at the rounded apex, entire and somewhat revolute along the margins, acute at the base, glabrous on both surfaces; midrib slender, impressed above, prominent beneath; secondaries filiform, 5--9 per side, irregular, ascending, very irregularly anastomosing in many loops some distance from the margins, obscure or very slightly subimpressed above, sometimes almost indiscernible; veinlet reticulation rather sparse, mostly obscure or indiscernible above or very rarely slightly subimpressed, slightly subprominulous beneath; inflorescence axillary, mostly at or near the tips of the twigs, the cymes mostly 3-flowered, shorter than the subtending leaves; peduncles very slender or filiform, 6--12 mm. long, flattened, brunnescent in drying, glabrous; pedicels filiform, 1.5--9 mm. long, glabrous, brunnescent in drying; bracts large, foliaceous, ovate, membranous, 7--10 mm. long, 5--6 mm. wide, usually about twice as long as wide, acute at the apex and base, glabrous on both surfaces; calyx tubular-campanulate, developing much more rapidly than the corolla (i.e., with the young corolla-bud lying at the base of the much larger calyx), to 2 cm. long when mature, membranous, glabrous, to 12 mm. wide at the apex when mature, venose, its rim 5-dentate, the teeth ovate, regular, 2--3 mm. long, rounded or obtuse at the apex; corolla pale-red, infundibular-cylindric, slightly incurved, its tube about 15 mm. long, glabrous or very slightly pilosulous, the lobes about 5 mm. long, lingulate, rounded at the apex, pilosulous; stamens and style slightly exserted; ovary merely glandulose.

The type of this species was collected by George Francis

Scott Elliot (no. 2612) in woods at Fort Dauphin, Madagascar, blooming in May, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. A vernacular name is "yndringuenitra".

Citations: MADAGASCAR: Cloisel 92 (P), 113 (N, P); Scott Elliot 2612 (K--type, N--photo of type, P--isotype, Z--photo of type).

VITEX UBANGHENSIS A. Chev., Etud. Fl. Afr. Cent. Franç. 1: 244, hyponym. 1913.

Literature: A. Chev., Etud. Fl. Afr. Cent. Franç. 1: 244. 1913; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 79. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 203. 1949.

Nothing is known of this species except that its type is Chevalier 6943, collected at Ndelle, upper Chari, December 20--25, 1902, and on Chevalier 10561, from the basin of the Tomi, beyond Mpokou, in upper Ubangi, December 6--10, 1903. No description of the plant has as yet been published.

VITEX UMBROSA Sw., Fl. Ind. Occid. 2: 1076--1077. 1800 [not V. umbrosa G. Don, 1824, nor Schau., 1940, nor "Sw. sensu Pulle", 1940].

Synonymy: Nephrandra Cothen. apud Willd., Sp. Pl. 3: 393, in syn. 1801.

Literature: Willd. in Cothen., Dispos. Veg. 8. 1790; Sw., Fl. Ind. Occid. 2: 1076--1077. 1800; Willd., Sp. Pl. 3: 392--393. 1801; G. F. W. Mey., Prim. Fl. Esseq. 218--219. 1818; Benth., Ann. Nat. Hist. 2: 449. 1839; Ettingsh., Blatt-Skel. Dikot. 79, pl. 32, fig. 8. 1861; Fawcett, Econom. Pl. 76. 1891; Fawcett, Provis. List Indig. Nat. Flow. Pl. Jamaica 30. 1893; Seymour, Host Ind. Fungi N. Am. 588--589. 1929; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Alph. List Common Names 6, 12, 33, & 34. 1939; Moldenke, Geogr. Distrib. Avicenn. 6. 1939; Moldenke, Prelim. Alph. List Invalid Names 33 & 52. 1940; Moldenke in Pulle, Fl. Suriname 4 (2): 307. 1940; Moldenke, Alph. List Invalid Names 33 & 55. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 26 & 104. 1942; Moldenke, Phytologia 2: 122--123. 1944; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 47 & 203. 1949; Roig, Dicc. Bot. 1: 828--829. 1953.

Illustrations: Ettingsh., Blatt-Skel. Dikot. pl. 32, fig. 8. 1861.

Large spreading tree, to 15 m. tall; trunk to 1 m. in diameter; branchlets rather stoutish, gray, obtusely tetragonal, very medullose, minutely puberulent, becoming glabrate; twigs medium or stoutish, obtusely tetragonal, brownish, densely puberulent when young; nodes annulate; principal internodes 0.3--5 cm. long, mostly greatly abbreviated; leaves decussate-opposite, 5--7-foliolate; petioles slender or stout, 3.5--7.5 cm. long, convex beneath, conspicuously flattened and submargined above, densely puberulent with very minute cinereous hairs, very slightly or not at all ampliate at the base, not disciform at the apex nor annulate; leaflets subequal or the lower ones much smaller, all rather long-petiolulate, the petiolules slender or stout, 2--22 mm. long, densely puberulent, deeply canaliculate and margined above, the lowermost ones usually considerably shorter than the central ones; leaflet-blades chartaceous, becoming firm in age, dark-green above, lighter beneath, the central one elliptic or ovate, often rather broad, 1.8--20 cm. long, 2.2--8.3 cm. wide, varying from obtuse and rounded to acute or very slightly short-acuminate at the apex (rarely emarginate), entire, rounded or acute at the base, sometimes slightly inequilateral, very lightly and obscurely pulverulent-puberulent on both surfaces (especially along the midrib), becoming glabrous and nitid, the lateral ones similar in all respects only usually smaller, shorter-stipitate, and more obtuse at the apex; midrib slender, flat or obscurely subimpressed above, prominent beneath; secondaries slender, 8--15 per side, arcuate-ascending, slightly prominulent above, prominulent beneath, arcuately joined near the margins; vein and veinlet reticulation fine and rather abundant, subprominulent above, obscure or the larger parts subprominulent beneath; inflorescence axillary, paniculate, 15--25 cm. long, 2--7 cm. wide, composed of 2--7 pairs of secondary panicles or long-stipitate and loosely branched cymes, many-flowered, very lax and loose-flowered, lightly or densely short-puberulent throughout with very minute canescent or gray-brown hairs; peduncle (4--9 cm. long) and rachis very slender, usually flattened, puberulent; bracts large and foliaceous, often a pair subtending the lowest branches, 5-foliolate, resembling the leaves in all respects but much smaller; bractlets varying from oblong to linear, simple, stipitate, 3--10 mm. long; prophylla linear, about 1 mm. long, densely puberulent; pedicels slender, 1--4 mm. long, puberulent; corolla blue, 2-lipped; fruit yellow, with the odor of apples (Malus).

The species inhabits woods, pastures, stream banks, and steep slopes near rivers, blooming in May. It has been collected in fruit in June, July, and September, and has been found at altitudes of 265 to 700 meters. A good fruit specimen is Britton 3619 at the New York Botanical Garden, and there is fruit of this species in Case 18, tray 2, at the Chicago Natural History Museum. Common names for it are "bois lezard", "box wood", "boxwood", "fiddle wood", "fiddlewood", "schattenliebende Müllen", "West Indian boxwood", and "yellow fiddlewood". The species is attacked by the parasitic fungus Meliola campylopoda Syd. Fawcett reports that, according to Harrison, the wood is used for boards and framing purposes and "works up easily".

Roig reports the name "roble guiro" for this species on the authority of Masa, but it seems apparent that the Cuban plant referred to is actually V. heptaphylla A. L. Juss., formerly confused with V. umbrosa. He states further that this vernacular name is applied in Pinar del Río also to Catalpa punctata Griseb., Sebesten galeottiana (A. Rich.) Britton, and Vitex tomentulosa Moldenke and in Oriente to Turpinia paniculata Vent., a species of Cotema, and a species of Tabebuia. The Vitex umbrosa referred to by Fawcett (1891) as occurring in Cuba is also V. heptaphylla, since the true V. umbrosa is endemic to Jamaica. Specimens have been confused in herbaria with Tabebuia bahamensis (Northrop) Britton and Tecoma pentaphylla Juss. The Scarff 5g [Mus Yale School of Forestry 35384; F--924753], distributed as Vitex umbrosa by Standley, is actually Catalpa longissima (Jacq.) Sims.

Citations: JAMAICA: Balbis s.n. (B); Bertero 2756 (B); N. L. Britton 466 (F--201115, N), 3619 (N, N); Collector undesignated s.n. [Hooker 837] (V), s.n. (Dc, Th, Th); Cuming 42 (Bm, V); Gosse 42 (X); W. Harris 5845 (B, F--145555, N), 9453 (B, F--212351, N, N, W--524736), 10579 (K, N, W--656398), 11975 (B, Bm, Cp, Du--122619, E--791089, E--791090, F--438970, G, Gg--31498, K, K, N, P, P, S, V, W--791022), 12083 (Bm, E--806833, F--450986, G, K, N, S, W--791993), s.n. [23.VII.95] (Ol); Harris & Britton 10579 (Bm, F--243426); Herb. Liebmann s.n. (Cp); Herb. Vahl s.n. (Cp); Linden 38 (Br, Br); March 1866 (B, G, K, K); Masson s.n. (Bm); McFadyen s.n. (K); Swartz s.n. (N--photo of type, S--type, Z--photo of type); W. Wright s.n. (K); Wullschlägel 1332 (Mu--1187).

VITEX UNIFLORA J. G. Baker, Journ. Bot. 20: 221--222. 1882.

Literature: J. G. Baker, Journ. Bot. 20: 221--222. 1882; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 76, 79, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104 (1942) and [ed. 2], 123 & 203. 1949.

Tall shrub or small tree, to 6 cm. tall; branchlets slender, very obsoletely tetragonal or subterete, brownish, not at all sulcate, very minutely and obscurely pilosulous and resinous-squamulose on the younger parts, glabrescent in age; nodes not annulate; principal internodes 1--4 cm. long; leaf-scars rather large, sunken, not especially prominent; leaves ternate, 1-foliolate, persistent; petioles slender, 3--15 mm. long, brunnescent in drying, obscurely puberulent-squamulose or glabrescent; blades chartaceous (not "subcoriaceous" as stated by Baker), obovate, 2--7.5 cm. long, 1.3--3 cm. wide, obtuse or rounded at the apex, sometimes slightly emarginate, entire, cuneate at the base, rather uniformly green and glabrous on both surfaces when mature, the immature leaves obscurely puberulent-pilose; midrib slender, flat above, very slightly subprominulous or almost flat beneath; secondaries filiform, few, about 3 per side, distant, irregular, ascending, obscure or very slightly subprominulous on both surfaces, irregularly anastomosing in shallow loops near the margins; veinlet reticulation sparse, obscure or indiscernible on both surfaces, or very slightly subprominulous above; flowers solitary, in the axils of the upper leaves, long-stalked; peduncles filiform, 2--2.5 cm. long, very minutely and obscurely puberulent-squamulose, brunnescent in drying, jointed at about the middle and there bearing a pair of linear bractlets which are persistent and 5--7 mm. long, subulate-tipped; calyx campanulate, nigrescent-brunnescent in drying, about 5 mm. long, 4--5 mm. wide, very minutely and obscurely puberulent-pilose, its rim 5-dentate, the teeth deltoid, about 1 mm. long, erect, acute at the apex; corolla dark-red, slightly incurved, cylindric, the tube about 1.8 cm. long, or somewhat funnelform, thinly pilose and squamulose outside, about 4 mm. wide at the apex, the lobes subequal, orbicular, 4--6 mm. long; stamens slightly exserted; style slightly exserted; ovary merely glandulose, 2-celled, with 2 ovules in each cell.

The type of this endemic species was collected by Richard Baron (no. 124) in the forests of western Betsileo, Madagascar, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. It is said to grow in woods on quartzite, and at an altitude of 1300 meters.

Citations: MADAGASCAR: Baron 124 (K--type, N--isotype, N--photo of type, Z--photo of type); Perrier de la Bâthie 12417 (N, P).

VITEX UNIFOLIOLATA Merr., Philip. Journ. Sci. 20: 438--439. 1922.

Literature: Merr., Philip. Journ. Sci. 20: 438--439. 1922; Merr., Enum. Philip. Pl. 3: 398. 1923; Hill, Ind. Kew. Suppl. 7: 252. 1929; Moldenke, Alph. List Common Names 3. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 63 & 104. 1942; Moldenke, Phytologia 2: 123. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 142 & 203. 1949.

Shrub or small tree, glabrous except for the inflorescence; branches somewhat tetragonal, pale-grayish, glabrous, the ultimate ones about 3 mm. in diameter; leaves 1-foliolate; petioles about 1 cm. long, glabrous; leaflet-blades coriaceous, pale-olivaceous when dry, oblong, 20--27 cm. long, 7--10 cm. wide, rather slender-acuminate at the apex, entire, rounded at the base, shiny, more or less bullate above, glabrous on both surfaces, slightly paler and densely punctulate beneath; secondaries 9--12 per side, prominent on both surfaces, curved-anastomosing; veinlet reticulation loose, very prominent; inflorescence solitary, terminal, slender, about 40 cm. long; peduncles about 6 cm. long, tetragonal, rather slender, about 2.5 mm. in diameter; primary inflorescence-branches only 1 or 2, greatly elongated, slightly pubescent; individual cymes widely scattered, few-flowered, 3--4 cm. long; calyx cupuliform, about 3 mm. long, the rim equally 5-lobed, the lobes ovate, about 0.5 mm. long, obtuse at the apex, appressed-pubescent with short hairs; corolla blue, about 11 mm. long, its tube about 5 mm. long, slightly pubescent on the outside, the lower lip 3-lobed, with the middle lobe large, orbicular, about 5 mm. in diameter, entire, glabrous, the 2 lateral lobes elliptic, rounded, about 3 mm. long, the upper lip about 2 mm. long; stamens somewhat exserted, villous below; young fruit glabrous or nearly so, enclosed by the accrescent fruiting-calyx.

The type of this species was collected by Ramos & Edaño [Philip. Bur. Sci. 37048] in forests along streams at low altitudes, Malangas, Zamboanga District, Mindanao, Philippines, on October

27, 1919, and is deposited in the herbarium of the Philippine Bureau of Science at Manila. A vernacular name is "babako".

The species is probably a member of the genus *Teijsmanniodendron*. Merrill says that it is closely related to *Vitex clarkeana* King & Gamble, which is *Teijsmanniodendron hollrungii* (Warb.) Kosterm., from which it differs in its very slender inflorescence, details of the corolla, such as the middle lobe of the lower lip being orbicular, entire, and glabrous, and in its glabrous and not tawny-pubescent fruits.

VITEX URCEOLATA C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 585. 1885.

Synonymy: *Vitex loureirii* Wight ex C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 585, in syn. 1885 [not *V. loureirii* Hook. & Arn., 1847]. *Vitex sumatrana* var. *urceolata* King & Gamble, Journ. As. Soc. Beng. 74: 849. 1909. *Vitex heterophylla* Schau. ex H. J. Lam, Verbenac. Malay. Arch. 187, in syn. 1919 [not *V. heterophylla* Roxb., 1814, nor Blume, 1858]. *Mithrudatea erecta* Hort. ex Moldenke, Prelim. Alph. List Invalid Names 32, in syn. 1940. *Vitex loureiri* Wight ex Moldenke, Alph. List Invalid Names 54, in syn. 1942 [not *V. loureiri* Hook. & Arn., 1836]. *Vitex sumatrana* var. *urceolata* H. J. Lam, in herb. *Vitex loureirii* Hook., in herb.

Literature: C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 585. 1885; King & Gamble, Journ. As. Soc. Beng. 74: 849. 1909; H. J. Lam, Verbenac. Malay, Arch. 187 & 370. 1919; Moldenke, Geogr. Distrib. Avicenn. 41. 1939: Moldenke, Prelim. Alph. List Invalid Names 32. 1940; Moldenke, Alph. List Invalid Names 33 & 53--55. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55--58, 60, 61, 64, 75, & 104 (1942) and [ed. 2], 128, 129, 133, 138--140, 143, 145, & 203. 1949.

Medium-sized tree, to 20 m. tall; branchlets stout, sharply or obtusely tetragonal, gray-brown or buff, not lenticellate, often with the youngest parts sulcate in drying, very minutely and obscurely pulverulent, subglabrate, or glabrous; pith rather large, white, tetragonal, solid; nodes often flattened and ampliate, plainly annulate; principal internodes 1.5--6 cm. long; leaves decussate-opposite, 3- or 5-foliolate; petioles rather slender or quite slender, 1.5--9.5 cm. long, flattened above, rounded or carinate beneath, very minutely and obscurely pulverulent or glabrate; petiolules very slender, 2--25 mm. long, the central one much longer than the lateral ones, the lowest sometimes subobsolete, deeply canaliculate-margined, obscurely pulverulent or glabrate; leaflet-blades chartaceous, dark-green above, somewhat lighter beneath, rather shiny on both surfaces, varying from obovate or oblanceolate to elliptic or oblong, the central one 3--14.5 cm. long, 1.6--7.5 cm. wide, short-acuminate or caudate at the apex (or rarely emarginate on freak leaves), entire, acute or long-attenuate and often more or less asymmetric at the base, glabrate or obscurely and minutely puberulent or pulverulent on both surfaces, usually resinous-dotted beneath, the lateral ones similar, but smaller; midrib slender, flat or subimpressed and usually pilosulous above, rounded-prominent beneath; secondaries slender, 7--9 per side, arcuate-ascending, arcuately joined in many loops near the margins, prominulous on both surfaces or flattened above; vein and veinlet reticulation abundant, the larger portions often subprominulous on both surfaces; inflorescence terminal and often also in the uppermost axils, the axillary ones racemose, the terminal ones racemose or paniculate with 1 or 2 lateral racemose branches; racemes narrow and rather short, 4--11 cm. long, 1.5--2.3 cm. wide, the flowers borne in 2--11 many-flowered whorls; peduncles rather stout or slender, 1.5--5.5 cm. long, similar to the branchlets in shape, color, and pubescence, but more slender; rachis similar to the peduncle, but more densely puberulent, straight or the lateral ones curvate-ascending; pedicels slender, 1--3 mm. long, very densely griseous-puberulent; bractlets and prophylla numerous, linear, 2--4 mm. long, densely griseous-puberulent, mostly twisted and recurved or circinately coiled; fruiting-calyx patelliform, about 1 cm. wide, minutely puberulent, its rim irregularly and shallowly 5-lobed; fruit drupaceous, subglobose, about 1 cm. long and wide, apiculate.

The species is based on Maingay 1205 and 3368 and Griffith 6064 from Malacca. It is said to inhabit forests, fruiting in November. Wilson says of it "tree 60 feet tall by 10 feet", but just what he means by the latter part of this statement is not clear. Specimens have been misidentified in herbaria as Vitex heterophylla Roxb., V. heterophylla var. undulata (Wall.) C. B. Clarke, V. quinata (Lour.) F. N. Will., and V. sumatrana var. typica H. J. Lam. Actually V. heterophylla Blume is a synonym of V. pinnata L., while V. heterophylla Roxb., V. loureiri Hook. & Arn., and V. loureirii Hook. & Arn. are synonyms of V. quinata.

Citations: ANDAMAN ISLANDS: South Andaman: Ulu Buboug [King's Collector] s.n. [3-6-1893] (Bz--25162). FORMOSA: E. H. Wilson 11127 (N--photo, Ph, Z--photo). MALAYA: Malacca: Griffith 6064 (N--cotype, N--photo of cotype, S--cotype, Ut--53409--cotype, Z--photo of cotype), s.n. [Malacca, 1845] (K); Maingay 1205 (K--cotype, N--cotype), 3368 (K--cotype). Perak: Ulu Buboug [King's Collector] 10406 (K). JAVA: Koorders 9338b [220d] (Bz--24214). BORNEO: Zwaan 799 [Boschproefst. BB.18539] (Bz--25442). CULTIVATED: Germany: Herb. Hort. Bot. Berol. s.n. (B, B, K, N--photo, S--photo, Z--photo).

VITEX VANSTEENISI Moldenke, Phytologia 4: 294. 1953.

Small tree; branchlets slender, very obtusely tetragonal, white-lenticellate, densely brown-puberulent; twigs similar but even more densely brown-puberulent; nodes annulate; principal internodes 2.5--4 cm. long; leaves decussate-opposite, 1-foliolate; petioles slender, 1--4 cm. long, very densely brown-puberulent, articulate at the apex; petiolules 4--6 mm. long, densely brown-puberulent; leaf-blades chartaceous, grayish-green above, elliptic or elliptic-ovate, 5.5--15 cm. long, 2.8--6.3

cm. wide, acute or acuminate at the apex, entire, acute or very shortly acuminate at the base, densely puberulent above, less conspicuously so in age, densely short-pubescent beneath with brown velutinous hairs; midrib slender, reddish, flat or very slightly subimpressed above, prominent beneath; secondaries slender, 7--10 per side, arcuate-ascending, reddish, anastomosing near the margins, flat above, prominulous beneath; inflorescence abbreviated, apparently axillary in the uppermost axils of the twigs, cymose, much shorter than the subtending leaves; peduncles slender, 1--1.5 cm. long, very densely short-pubescent with dark-brown velutinous hairs; cymes 1--1.5 cm. long and wide, rather dense; bractlets linear, 1--2 mm. long, densely short-pubescent; calyx campanulate, its tube about 3 mm. long, very densely fulvous-pubescent, the lobes elongate, oblong, foliaceous, conspicuous, 2--3 mm. long, acute; immature corolla short-exserted, yellow, its tube cylindric, about 8 mm. long, densely puberulent; fruiting-calyx and fruit not known.

The type of this species was collected by Cornelis Gijsbert Gerrit Jan van Steenis (no. 9400) along a forest edge, at 1300 to 1500 meters altitude, between Gadjah and Blana Kedjerren (Gajo 'Lands), northern Sumatra, on February 27, 1937, and is deposited in the herbarium of the Botanisch Museum at Utrecht. The species in its general habit reminds one greatly of V. erioclona H. J. Lam and in its calyx characters of V. longisepala King & Gamble.

Citations: SUMATRA: Van Steenis 9400 (N--isotype, N--photo of type, Ut--type, Z--photo of type).

VITEX VAUTHIERI P. DC. ex Schau. in A. DC., Prodr. 11: 690--691. 1847.

Synonymy: Besleria arborea Vell., Fl. Flum. 261 (1825), Icon. 6: pl. 82. 1827 [not Vitex arborea Roxb., 1814, nor Fischer, 1829, nor Desf., 1847]. Psilogyne multiflora A. DC. ex Moldenke, Prelim. Alph. List Invalid Names 39, in syn. 1940. Vitex sellowiana var. lundiana Hieron. ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940.

Literature: Roxb., Hort. Beng. 46. 1814; Vell., Fl. Flum. 261 (1825), Icon. 6: pl. 82. 1827; Desf., Cat. Hort. Paris, ed 3, 391. 1829; Schau. in A. DC., Prodr. 11: 685 & 690--691. 1847; Schau. in Mart., Fl. Bras. 9: 300. 1851; Glaz., Mém. Soc. Bot. France 3: 547. 1909; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Prelim. Alph. List Invalid Names 39 & 52. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Alph. List Invalid Names 39 & 55. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 70 & 87. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 203. 1949.

Illustrations: Vell., Fl. Flum. Icon. 6: pl. 82. 1827.

Shrub or tree; branchlets medium-slender, obtusely tetragonal or subterete (often triangular and deeply sulcate between the angles), gray, minutely puberulent, medullose, not conspicuously lenticellate; twigs slender, obtusely tetragonal, often flattened and sulcate and slightly ampliate at the nodes, densely puberulent with cinereous or sordid-yellowish puberulence; nodes slightly annulate, often very obscurely so; principal internodes 1--8.5 cm. long; leaves decussate-opposite, 3--7-foliolate, unfolding with the flowers; petioles rather slender or occasionally stoutish, 2--9 cm. long, densely puberulent like the twigs, slightly ampliate at the base, somewhat disciform at the apex; leaflets subequal or the lower ones smaller than the central one, the two lowermost often greatly reduced, all short-petiolulate on densely puberulent deeply sulcate and margined petiolules 1--7 mm. long or the lowermost subsessile; leaflet-blades firmly chartaceous, often quite thick when mature (or even subcoriaceous), very dark-green above (usually brunnescent in drying, much lighter or sordid-gray beneath, the central one narrow-elliptic, 4--13 cm. long, 1.7--4.2 cm. wide, acute or very short-acuminate at the apex, rarely obtuse, entire, acutely attenuate at the base, minutely puberulent throughout above, densely puberulent beneath with distinct sordid-gray or brownish hairs, the lateral ones similar in all respects but smaller, more shortly petiolulate, and mostly less acuminate at the apex; midrib slender, subimpressed above, prominent beneath; secondaries slender, very numerous and close together, 13--40 per side, ascending, parallel, straight, arcuately joined at the margins beneath, subimpressed above, prominulent beneath; vein and veinlet reticulation rather abundant, subimpressed above, subprominulent beneath; inflorescence axillary, cymose, 1.5--11 cm. long, 1--8 cm. wide, 1--4 times dichotomous, usually equaling or exceeding the petioles, loosely many-flowered, the branches widely divaricate; peduncles slender or stoutish, 3.5--8 cm. long, flattened, rather densely puberulent or very short-pubescent like the twigs and petioles, slightly ampliate at the apex and annulate with a band of denser pubescence; cyme-branches rather stout, conspicuously flattened, puberulent and annulate like the peduncles; pedicels rather stoutish, about 1 mm. long, densely puberulent or short-pubescent; bracts and bractlets often abundant, caducous, elliptic, to 1 cm. long and 3 mm. wide, simple, sessile, obtuse at the apex, densely canescent-pubescent beneath, usually nigrescent above in drying; prophylla often large and similar to the bractlets; calyx campanulate, 2--3 mm. long, about 3 mm. wide, acute at the base, densely short-pubescent, canescent, deeply 5-lobed to about the middle, obtuse, often reflexed, nigrescent within; corolla hypocrateriform, its tube broad, 5--6 mm. long, densely puberulent throughout on the outside, its limb 5-lobed, four of the lobes subequal, about 4 mm. long, and obtuse, the fifth (lowest) lobe much enlarged, about 7 mm. long, obovate-spatulate, all densely puberulent externally, the large lobe somewhat puberulent or barbellate at the base within; stamens and style exserted, projecting 3--4 mm. from the corolla-mouth; fruiting-calyx and fruit not known.

The type of this endemic species was collected by Vauthier (no. 193) near Rio de Janeiro between 1831 and 1833. The species has been confused with V. cymosa Bert. by Glaziou in the reference cited above and with V. sellowiana Cham. by herbarium workers. It has been collected in anthesis from September to December. The numerous, straight, parallel, and close secondaries, impressed venation on the upper leaf-surface, and the cymes usually equaling or surpassing the petioles distinguish this species very well. The specimen of *Glaziou 8830* in the Delessert Herbarium at Geneva illustrates the 3-angled branchlets often seen on this species.

Citations: BRAZIL: Federal District: *A. Lutz 589* (Lz). Minas Gerais: *Warming s.n.* [Lagoa Santa] (V); *Widgren s.n.* (Ja—5988). Rio de Janeiro: *Glaziou 3066* (Br, Br, Cp, Cp, K, N, N—photo, N—photo, P, P, P, Z—photo, Z—photo), *3679* (Br, G, P), *4159* (B, K, P), *4195* (Cp), *8830* (B, Cb, Cb, Cp, K, N, P, P); *Vauthier 193* [Macbride photos 7882] (B—isotype, B—photo of type, Cb—isotype, Dc—type, Dc—isotype, F—870989—isotype, F—645689—photo of type, K—isotype, Kr—photo of isotype, Le—isotype, Mi—photo of type, N—photo of type, N—photo of isotype, N—photo of isotype, P—isotype, V—isotype, Z—photo of type). São Paulo: *J. T. Lima s.n.* [São Paulo, December 1943; Herb. Rio de Janeiro 48996] (N); *Löfgren s.n.* [Rio Alto Tiete, Oct. 22, 1901; Herv. Com. Geogr. e Geol. S. Paulo 5845] (N, Sp—15603, Sp). State undetermined: *Bowie & Cunningham s.n.* (Bm); *Lund 818* [Serra de Taguahy] (Bm).

VITEX VELUTINA (Koord. & Val.) Koord., Exkursionsfl. Java 3: 137. 1912.

Synonymy: *Vitex heterophylla* var. *velutina* Koord. & Val., Bijdr. Booms. Java 7: 207—208. 1900.

Literature: Koord. & Val., Bijdr. Booms. Java 7: 204 & 207—208. 1900; Koord., Exkursionsfl. Java 3: 137. 1918; Koord. & Val., Atlas Baumart. Java 2: 6, pl. 297. 1914; Heyne, Nutt. Plant. Nederl. Ind., ed. 1, 4: 113. 1917; H. J. Lam, Verbenac. Malay. Arch. 167, 185, & 370. 1919; Heyne, Nutt. Plant. Nederl. Ind., ed. 2, 1320. 1925; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Suppl. List Common Names 11. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 64 & 104. 1942; Moldenke, Alph. List Invalid Names 53, 1942; Moldenke, Phytologia 2: 123. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 145 & 203. 1949.

Illustrations: Koord. & Val., Atlas Baumart. Java pl. 297. 1914.

Tree; branchlets tetragonal, velutinous; leaves 5-foliolate; petioles velutinous; petiolules 1—2 cm. long; leaflet-blades elliptic-oblong, membranous, the central one 10—22 cm. long, 4.5—10 cm. wide, short-acuminate at the apex, acute at the base, scabrid-punctate above, velutinous beneath, the lateral ones half as long as the central one; inflorescence paniculate, leafy toward the base, velutinous; bracts linear; calyx about 3 mm. long, sparsely pubescent outside; corolla about 1 cm. long, sparsely pubescent externally, entirely glabrous within, the tube sigmoid, the limb 2-lipped, 5-lobed.

The species is based on *Koorders 20101b*, *20217b*, *24703b*, *24779b*, and *27045b*, collected at Noesakembangan, Java. Common names for it are "kĕtilĕng" and "manebom boenga". The Tamesis collection cited below was previously misidentified by herbarium workers as V. parviflora A. L. Juss. and V. parviflora f. sterilis H. J. Lam, while the Borden collection was confused with Viticipremna philippinensis (Turcz.) H. J. Lam.

Citations: PHILIPPINE ISLANDS: Luzon: Borden s.n. [Herb. Philip. Forest Bur. 3059] (Bz--25369, N); Tamesis s.n. [Herb. Philip. Forest Bur. 11903] (Bz--24553). SUMATRA: Dirksen 10 (Bz--25370); Gusdorf 128 (Bz--25371, Er, N). JAVA: Koorders 20101b [1039c] (Bz--35375--cotype), 20217b [1127c] (Bz--25374--cotype), 24703b [1039c] (Bz--25376--cotype), 24779b [1127c] (Bz--25373--cotype), 27045b (Bz--25377--cotype, Bz--25378--cotype, Bz--25659--cotype), 40237b [1039c] (Bz--25372).

VITEX VENULOSA Moldenke, Phytologia 4: 64--65. 1952.

Tree; branches heavy, medullose, very decidedly tetragonal, densely appressed-tomentellous with ochraceous hairs, often somewhat ampliate and more compressed at the nodes; nodes annulate; principal internodes 2--6 cm. long; leaves decussate-opposite, palmately compound, 5-foliolate; petioles elongate, stout when mature, 5.5--18 cm. long, very densely appressed-tomentellous or puberulent with ochraceous hairs, club-like at the apex; leaflets rather firmly chartaceous, bright-green above, nigrescent in drying, lighter beneath, microscopically puberulous or glabrescent above, very densely tomentellous with cinereous-ochraceous hairs beneath, elliptic or broadly elliptic, acute or short-acuminate at the apex, entire, acute or rounded at the base or rarely subacuminate, the central ones 7--18 cm. long and 3.3--7.5 cm. wide, the basal ones much smaller; petiolules stout, 4--15 mm. long, densely puberulent; midrib rather stout, flat above, very prominent beneath; secondaries very numerous and close, 17--20 per side, spreading-ascending, parallel, not arcuate except at the very margins where they are incompletely anastomosing, flat above, prominent beneath; veinlet reticulation very abundant, flat and obscure above but very conspicuous to the smallest parts beneath and decidedly prominulous there, the tertiaries subparallel, at right angles to and connecting the secondaries; inflorescence axillary, cymose, shorter than the subtending leaves; peduncles stout, about the same diameter as the subtending petiole, 4.5--11.5 cm. long, densely ochraceous-puberulent; cymes many times bifurcate, the branches wide-spreading, loosely or densely many-flowered, densely ochraceous-puberulent throughout, the branches rather conspicuously flattened and sulcate, conspicuously annulate at the nodes; bractlets linear, 3--15 mm. long, densely puberulent; pedicels very slender, much abbreviated, usually 1 mm. long or less, densely ochraceous- or cinereous-puberulent or short-pubescent; calyx campanulate, about 2.5 mm. long and wide, densely short-pubescent with antrorse ochraceous hairs, its rim subtruncate, subentire or minutely apiculate; corolla violet, about 8 mm. long, its tube about 5 mm. long, densely short-pubescent with cinereous hairs outside; fruiting-calyx cupuliform, about 5 mm. long and 8 mm. wide, densely short-pubescent with cinereous hairs, truncate and subentire or minutely denticulate; fruit drupaceous, subglobose, about 1 cm. long and wide, glabrous, shiny.

The type of this species was collected by Jean Lebrun (no. 5878) in the forest at Lumuna, Belgian Congo, in August, 1932, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

Citations: BELGIAN CONGO: Delevoy 630 (Br, Br, N); Herman 2199 (Br, Br, Br, N, N); Lebrun 5878 (Br--type, Br--isotype, N--photo of type, Z--photo of type); Quarré 5105 (Br); Ritschaux 1568 (Br), 1569 (Br); Vanderyst 5715 (Br).

VITEX VERMOESENI DeWild., Ann. Soc. Scientif. Brux. pl. 49, sér. B, p. 66. 1929; Plant. Bequaert. 5: 16--19. 1929.

Literature: DeWild., Ann. Soc. Scientif. Brux. pl. 49, sér. B, p. 66. 1929; DeWild., Plant. Bequaert. 5: 5 & 16--19. 1929; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 87. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 203. 1949.

Large tree or shrub; branches subcylindric, short-pubescent when young, glabrescent in age; leaves 5-foliolate, the central leaflet usually more developed than the rest; petioles 4.5--11 cm. long, more or less plainly canaliculate above, shortly velutinous-pubescent, more or less densely pilose at the apex; petiolules 2--10 mm. long; leaflet-blades lanceolate-elliptic, 2--12 cm. long, 1.1--4.5 cm. wide, more or less long-acuminate at the apex, entire, narrowed into the petiolule at the base, glabrous above, glabrous (except for the more or less appressed-pilose venation) and densely glandulose beneath with subcircular, more or less concave, and brilliantly shiny glands; secondaries 10--14 per side; inflorescence cymose, the axillary cymes more or less branched, the branches to 4 cm. long, forming a large terminal panicle; peduncles 5--9 cm. long, short-puberulent; lower bracts lanceolate, puberulent; bractlets filiform, to 3 mm. long on the upper branches, puberulent, caducous; flowers numerous, pedicellate; pedicels about 1 mm. long, pubescent; calyx cupuliform, about 1 mm. long, puberulent, its rim shortly 5-dentate; corolla short-tubular, its tube 3--3.5 mm. long, velutinous externally, the limb 5-lobed, the upper lobe 3--3.5 mm. long and 4 mm. wide, the other lobes about 1.5 mm. long; stamens and style short-exserted; ovary subglobose, glandulose, pilose at the summit; fruiting-calyx accrescent, patelliform, about 12 mm. wide, glabrous inside, with scattered but plainly visible hairs on the outside; fruit ovoid-globulose, 1.9--2 cm. long and wide.

The species is based on Vermoesen 1742 from Temvo, Belgian Congo, collected on March 6, 1919, on Vermoesen 1933 from the same locality, collected on April 4, 1919, on de Briey 55 from Ganda-Sundi, collected in 1911, on Sparano 129 from the vicinity of Luluabourg, collected in 1913, and on Pynaert 1696 from Eala, collected in 1907. The species is undoubtedly closely related to

V. rivularis Gürke.

DeWildeman questions whether Pieper has designated the correct specimen in the Berlin herbarium as the type collection of V. rivularis, of which Zenker 1333 is unquestionably the actual type. He states that Vermoesen distinguished the present taxon from V. rivularis by a note on a herbarium specimen reading "Aff. rivularis sed folia supra glabrescentia, subtus dense et minute punctulata. Foliola, ad venos glaberrimo vel pilis rarioribus praedita." He continues: "Chez la plante du Congo les feuilles sont en effet glabres sur la face supérieur; chez le type camérounien elles sont munies do poils allongés, plus ou moins apprimés, sur le limbe et sur les bords ciliés, plus ou moins abondants, toujours présente chez les spécimens que l'on peut rapprocher sans le moindre doute du type de Guerke, dont le sommet du pétiole commun est également à poils allongés, comme les nervures, alors que dans la forme décrite ci-dessus on ne trouve au sommet du pétiole que des poils relativements courts. La diagnose de Guerke n'a malheureusement pas attiré l'attention sur ces caractères, elle dit même: 'foliolis.....supra glabriusculis et secundum nervos pilosioribus', ce qui n'est donc pas tout à fair exact.

"Guerke ajoute à propos du calice: 'calice per anthesin cupuliforme, extus glanduloso, 5-dentato, post anthesin valde accrescente' et dans les explications en texte allemand: 'Der Kelch ist zur Blütezeit napförmig, mit gelben Drüsen bedekt, 5-zähnig; zur Fruchtzeit vergrössert er sich stark und ist dann kugelig mit flachen aber deutlichen Zähnen......'

"L'échantillon type: Zenker n. 1333, que nous avons pu examiner ne possède pas de fleurs; des calices fructifères non à maturité sont seuls présents.

"Dans nos plantes, comme dans celles que M. Pieper....rapporte au type rivularis, le calice est velu à l'état jeune, et nous retrouvons des poils sur les calices adultes de la plante du Mayumbe. Dans celle-ci le calice sous le fruit forme un plateau ondulé sur le bord duquel les dents ne sont plus marquees.

"Il semble donc qu'il y aurait lieu de réétudier toutes ces plantes affin de faire concorder ces caractères, la présence de glandes calicinales jaunes, ne se marque guère sur le n. 1333 de Zenker, celle des granulosités de la surface de ce même organe, ne sont guère visibles à l'oeil nu, ni sur cet échantillon ni sur le document que nous renseignons sous le nom de V. vermoeseni. Par contre les poils sont très nets sur les calices fortement accrus et cela même après le détachement du fruit.

"Nous ne pouvons nous empêcher de signaler ces plantes sous un nom nouveau; il n'aura peut-être pas dans l'avenir une valeur spécifique, mais pourrait permettre de distinguer une race plus ou moins nettement définie."

DeWildeman in his Plantae Bequaertianae reference cited above describes the upper corolla-lobe as "9" mm. wide in his Latin diagnosis and as "4" mm. wide in his French description. In the French description he also states that the pedicels are "accrescent". Specimens of this species have been misidentified in herbaria as V. longipetiolata Gürke.

Citations: BELGIAN CONGO: Flamigni 4 (Br, Br, Br, N); Vermoesen 1742 (N—cotype, N—photo of cotype, S—cotype, Z—photo of cotype). LOCALITY OF COLLECTION UNDETERMINED: Herb. Jard. Colon. Lisboa 7841 (N).

VITEX VERTICILLATA A. Chev., Etud. Fl. Afr. Cent. Franç. 1: 244. 1913.

Literature: A. Chev., Etud. Fl. Afr. Cent. Franç. 1: 244. 1913; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 80. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 203. 1949.

Nothing is known of this species except that Chevalier states that it is a shrub 0.5—1 m. tall, with white flowers, the lower corolla-lip blue.

The type of the species is Chevalier 5490, collected in thickets between Kemo and Tomi, upper Ubangi, in Ubangi-chari, French Equatorial Africa, on September 22, 1902. Although Chevalier's description is very brief and totally inadequate, in my opinion the binomial is validly published under the present International Rules of Botanic Nomenclature.

VITEX VESTITA Wall., Numer. List [48], no. 1750, hyponym (1829); Schau. in A. DC., Prodr. 11: 692—693. 1847.

Synonymy: Vitex finlaysoniana Wall., Numer. List 215, no. 6314, hyponym. 1832. Vitex neglecta H. J. Lam in Lam & Bakh., Bull. Jard. Bot. Buitenz., sér. 3, 3: 63. 1921. Vitex neglecta var. puberula H. J. Lam in Lam & Bakh., Bull. Jard. Bot. Buitenz., sér. 3, 3: 63. 1921. Vitex vestita var. neglecta H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5: 176. 1922. Vitex vestita var. neglecta f. puberula H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5: 176. 1922. Vitex vestita var. genuina H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5: 176. 1922. Vitex lanceolata P'ei, Mem. Sci. Soc. China 1 (3) [Verbenac. China]: 114. 1932. Vitex vestita var. glabrior Teijsm., in herb. [not V. vestita var. glabrior H. J. Lam]. Vitex vestita f. glabrior Teijsm., in herb.

Literature: Wall., Numer. List [48], no. 1750 (1829) and 215, no. 6314. 1832; Schau. in A. DC., Prodr. 11: 692—693. 1847; Miq., Fl. Ind. Bat. 2: 864. 1856; Miq., Fl. Ind. Bat. Suppl. 1: 242 & 568. 1860; Kurz, For. Fl. Brit. Burma 2: 272. 1877; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 587. 1885; F. N. Will., Bull. Herb. Boiss., sér. 2, 5: 431. 1905; King & Gamble, Mat. Fl. Malay Penins. 854. 1905; King & Gamble, Journ. As. Soc. Beng. 74: 854. 1909; Heyne, Nutt. Plant. Nederl. Ind., ed. 1, 4: 117. 1917; H. Hallier, Meded. Rijks Herb. Leid. 37: 54. 1918; H. J. Lam, Verbenac. Malay. Arch. 169, 205—206, & 370. 1919; H. J. Lam in Lam & Bakh., Bull. Jard. Bot. Buitenz., sér. 3, 3: 60 & 63. 1921; H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5: 176. 1922; Ridl., Fl. Malay Penins. 635. 1923; Heyne, Nutt. Plant. Nederl. Ind., ed. 2, 1320. 1925; P'ei, Mem. Sci. Soc. China 1 (3) [Verbenac. China]:

112 & 114. 1932; Dop, Fl. Gén. Indo-chine 4: 839. 1935; Fletcher, Kew Bull. 1938: 436. 1938; Moldenke, Suppl. List Common Names 2—4, 6, 7, 9, 11, 13—15, 18, 19, 21, & 23. 1940; Moldenke, Prelim. Alph. List Invalid Names 50. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55—57, 60, 61, 64—66, & 104. 1942; Moldenke, Alph. List Invalid Names 53. 1942; Moldenke, Phytologia 2: 123. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 59. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 128, 129, 133, 138—140, 144—146, 148, & 203. 1949.

A moderate-sized or shrubby tree, 6—32 m. tall; trunk to 10 cm. in diameter; branchlets round, softly pubescent with grayish-tawny hairs; leaves 3-foliolate; petioles 3.5—10.5 cm. long, softly pubescent with grayish-tawny hairs; leaflet-blades chartaceous, lanceolate, acuminate at both ends, entire, sparsely puberulent above, denser on the venation, tomentose and glandular beneath, the central one 11.5—19 cm. long, 5—10 cm. wide, on a petiolule 1.5—6 mm. long, with 8—10 secondaries, the lateral ones 8—16 cm. long, 4—6.5 cm. wide, often asymmetric at the base, on petiolules 5—10 mm. long, with 5—7 secondaries; cymes in the upper leaf-axils, softly pubescent with gray-tawny hairs, usually 2—4 arranged in vertical fashion in each axil, dichotomous, 2.5—6 cm. long and wide; peduncles 0.7—2.5 cm. long, softly pubescent; flower-buds yellowish-green; flowers slightly fragrant; calyx yellowish-green, cupuliform or subcylindric, subbilabiate, about 3 mm. long and 2 mm. wide, pubescent and glandulose outside, glabrous within, its rim 5-dentate, the teeth small, deltoid; corolla varying from white to yellow or lemon-yellow, its tube cylindric, slender, about 8 mm. long and 1 mm. wide, densely glandular (except at the base) with rather large yellow glands or glanduliferous hairs, glabrous within except for a ring of stiff antrorse hairs about 2.5 mm. from the base within, the limb 5-lobed, the lobes subequal, 1—1.5 mm. long, ovate, densely glandular with rather large yellow glands or glanduliferous hairs, sometimes somewhat pilose on the back, glabrous above; stamens subequal, included, glabrous, inserted about 5 mm. from the base of the corolla-tube, about 4 mm. long; anthers whitish, the thecae light-brown; pistil whitish; style slender, about 1 cm. long; stigma light-green, very shortly bifid; ovary yellow, orange toward the base, glabrous and subcylindric at the base, abruptly narrowed into a glandular-dotted beak at the apex; fruit drupaceous, reddish-brown, globose, about 6 mm. long and wide, the lower 1/3 included by the somewhat enlarged fruiting-calyx.

The type of this species was collected by Nathaniel Wallich [né Nathan Wolff] (*no. 1750*) at Taong-Dong Avae [or "Toong", according to Schauer], Penang, Malaya. The type of *V. lanceolata* is *A. Henry 11883a* from Yünnan, China, while that of *V. neglecta* var. *puberula* is *Ajoeb 182*, collected on the Jacobson Expedition to Sumatra at Rimbo Pengadang, at an altitude of 1000 meters, on April 16, 1916. *V. neglecta* var. *genuina* was based on *Clemens 11172* and *9813* from British North Borneo, *Horsefield s.n.* from

Java, *Teijsmann 1158*, *1165*, and *2671* from Sumatra, and *Mutkiah 7742* from Johore, plus, according to Lam, the specimens cited by him in his 1921 work, viz., *Scheffer s.n.* from Java, *Teijsmann s. n.* from Muntok, and *Buurman van Vreeden 159* from Sumatra.

Dr. Lam cites Wallich's Numerical List nos. 1750 and 6314 both as "1828", but the former was published first in 1829 and the latter in 1832, according to Dr. John H. Barnhart, noted botanic bibliographer. Heyne says of the wood of this species "Het lichte, witachtig reekleurige hout wordt gebruikt voor daksparren en brandhout; het is veel minder in kwaliteit dan dat van *V. pubescens*, Vahl (Ridley, Mal. Timmerhoutsoorten, bl. 84)".

Lam separates his var. *neglecta* on the calyx being distinctly 2-labiate, the lower lip 2-dentate, the upper lip more or less elongate, 1--2 mm. long, while in the typical form of the species the calyx is subregular, minutely 5-denticulate, the lower lip 2-denticulate, the upper lip entire or very minutely 3-denticulate. He says that the central petiolules are 1.5--6 cm. long, but this is probably a misprint for "mm."

The *Bemmel 11* cited below is anomalous, with very obtuse leaflets, but is still very immature. The species is said to be very common on dry land in Sumatra and also inhabits the edge of open marshy ground and the edges of jungles, from 150 to 5000 feet elevations. It has been collected in anthesis in January, April, May, and December, and in fruit in June and October. Common names recorded for it are "alaban baengat", "bangas jantan", "black lĕban", "bŏti-bŏti", "chichah", "flowery lĕban", "halban", "haleban", "halĕban", "horn lĕban", "kajoe djokkal isap", "kaju berebah", "kepayan", "lĕban", "lĕban bunga", "lĕban hitam", "lĕban kunyit", "lĕban nasi", "lĕban nasi-nasi", "lĕban nasi rimba", "lĕban pelandok", "leban tandok", "lĕban tandok", "maramboeĕng", "maramboeeng", "marambuĕng", "mouse-deer's lĕban", "rice lĕban", "sepit", "sĕpit", "tampang besi", "tampang bĕsi", and "tumeric lĕban". It is of interest to note that "black leban", "halĕban", "lĕban hitam", and "lĕban nasi-nasi" are also applied to *V. pinnata* L.; "lĕban nasi" is applied also to *V. gamosepala* Griff.; "halban", "lĕban kunyit", and "tumeric lĕban" apply also to *V. pinnata* and *V. longisepala* King & Gamble; "horn lĕban" and "leban tandok" are applied also to *V. pinnata* and *V. quinata* (Lour.) F. N. Will.; "lĕban" is applied also to *V. negundo* L. and *V. pinnata*; "flowery lĕban" and "lĕban bunga" apply also to *V. longisepala*, *V. pinnata*, and *V. quinata*; and "tampang bĕsi" is applied also to *Callicarpa candicans* (Burm. f.) Hochr., *C. longifolia* Lam., and *C. maingayi* King & Gamble.

Lam cites *Ploem s.n.* (Le--90927-27) and *Blume s.n.* (Le--908267-628) from Java and *Korthals s.n.* (Le--908266-786, Le--908266-787, Le--908266-755) and *H. Bog. 1158*, *1165*, and *3671* from Sumatra, Fletcher cites *Kerr 6238* and *Schmidt 434* from Thailand. Hallier cites *Korthals s.n.* from Sumatra and *Beccari 1633* from Sarawak.

Citations: INDIA: Assam: *Bor 4446* (K). CHINA: Yunnan: *A. Henry*

11883a (N, N, N--photo), 11883b (N), 12310a (N), 12310b (N), 13651 (N, N, N--photo). INDOCHINA: Laos: Pételot 4537 (N). KOH CHANG ISLAND: E. J. Schmidt 294 (S). MALAYA: Johore: Holttum 9212 (Bz--25397); Nur & Kiah bin Hadji 7742 (Bz--25398). Malacca: Cuming 2351 (V); W. Griffith s.n. [1845] (Br, Br). Negri Sembilan: Nur 11508 (Bz--25405). Pahang: M. R. Henderson 23407 (Bz--25403, N). Penang: Wallich 1750 (Cb--isotype, Cb--isotype, N--photo of isotype, T--isotype, Z--photo of isotype), 1750b (M, S). Singapore: Herb. Mus. Palat. Vindob. 2483 (V); Liew 405 [Singapore field no. 36496] (Bz--25402). LINGGA ARCHIPELAGO: Lingga: Bünnemeijer 6963 (Bz--25399, Bz--25400). SUMATRA: Ajoeb 182 (Bz--25383, N--photo, Z--photo); Anta s.n. [Kostermans 608] (Bz--72943); Boeea 7049 (S), 9827 (N); Buurmann van Vreeden 159 [Herb. Bot. Variorum Hort. Bogor. 159] (Bz--25414, Bz--25415); Endert 9 [Boschproefst. E.1210] (Bz--25424), E.813 (Bz--25384, Bz--25385); Krukoff 319 (Bz--25425), 4117 (Br, Bz--25416, N); Teijsmann 1158 H.B. (Bz--25422, Ut--44159), 1165 H.B. (Bz--25420, Bz--25421, Ut--44156, Ut--44157), 3671 H.B. (Bz--25419, Ut--44158); Toroes 284 (N, S), 1236 (N), 4238 (N), 4497 (N); Voogd 544 (Bz--25411, Bz--25412); Yates 1648 (Bz--25417, Bz--25418, N), 2140 (Bz--25423, N). JAVA: Horsfield s.n. [Java, 1862-1918] (Bz--25426); Scheffer s.n. [Bogor] (Bz--25427). BRITISH NORTH BORNEO: M. K. Clemens 11172 (N--photo, Ph, Z--photo); Clemens & Clemens 26679 (N), 29768 (Bz--25386, N), 29999 (N). LESSER SUNDA ISLANDS: Banka: Anta 755 (Bz--73024); Teijsmann s.n. [Bangka] (Bz--25406, Bz--25407, N). Muntok: Teijsmann s.n. [Muntok] (Bz--25408, Bz--25409). Timor: Bemmel 11 [Boschproefst. BB.6947] (Bz--25438). CULTIVATED: Java: Herb. Hort. Bogor. XI.J.11 (Bz--25410, Bz--25676), XI.K.6 (Bz--26577). LOCALITY OF COLLECTION UNDETERMINED: Herb. Martius s.n. (Br).

VITEX VESTITA f. GLABRESCENS Moldenke, Phytologia 3: 489. 1951.

This form differs from the typical form of the species in having the lower leaf-surfaces, petioles, branchlets, and inflorescences glabrous or subglabrescent.

The type of the form was collected by Rahmat Si Toroes (no. 4698) along the Aek Roppak, near Hoeta Imbaroe (topographic sheet 41, northwest quarter), subdivision Padang Lawas, division Padang Si Dimpoean, Tapianoeli, Sumatra, between June 22 and 30, 1933, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is described as a treelet.

Citations: SUMATRA: Toroes 4698 (N--type), 5230 (N).

VITEX VESTITA f. MILLSII (Henderson) Moldenke, Phytologia 3: 489. 1951.

Synonymy: Vitex millsii Henderson, Journ. Asiat. Soc. Malaya 5: 262. 1927.

Literature: Henderson, Journ. Asiat. Soc. Malaya 5: 262. 1927; Fedde, Bot. Jahresber. 59 (2): 417. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 61 & 103. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 72. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 139 & 201. 1949.

This form differs from the typical form of the species in having the inflorescence spreading-pubescent and the leaves glabrous above, spreading-pubescent on the midrib beneath, otherwise glabrous.

The type of the form was collected by Murray Ross Henderson (*no. 17958*) at 4500 feet elevation at Robinson Falls, Cameron's Highlands, Pahang, Malaya, on November 24, 1925. It is named in honor of G. R. Mills, an English planter at Batu Gajah, Pahang, where he collected plants around the year 1925.

Citations: MALAYA: Pahang: *M. R. Henderson 17958* (Bz--25404--isotype, N--isotype, N--photo of isotype, Z--photo of isotype).

VITEX VESTITA var. SIAMICA Moldenke, Phytologia 4: 65. 1952.

This variety differs from the typical form of the species in having its leaflets only 2.5--8 cm. long and 1--3.5 cm. wide at time of anthesis, more or less serrate along the margins, and the short pubescence confined to the venation only beneath.

The type of the variety was collected by Kasin (*no. 346*) on a rock at Tripagodas, about 40 km. north of Wagka, on the Burmese border, Thailand, on May 14, 1946, and is deposited in the Herbarium Bogoriense at Buitenzorg. It is known thus far only from the original collection.

Citations: THAILAND: *Kasin 346* (Bz--73302--type, N--isotype, N--photo of type, Z--photo of type).

VITEX VESTITA f. WINKLERI Moldenke, Phytologia 3: 489--490. 1951.

This form differs from the typical form of the species in having its lower leaf-surfaces, petioles, branchlets, and inflorescences merely finely puberulous.

The type of the form was collected by Hubert Winkler (*no. 2433*) -- in whose honor it is named -- in southeastern Borneo on June 13, 1908, and is deposited in the Herbarium Bogoriense at Buitenzorg. It has been confused in herbaria with *V. vestita* var. *genuina* H. J. Lam.

Citations: SUMATRA: *Toroes 1497* (N, S). BRITISH NORTH BORNEO: *M. S. Clemens 9813* (Bz--25389), *11172* (Bz--25388); *Clemens & Clemens 26679* (Bz--25390, Bz--25391, N), *29999* (Bz--25387). BORNEO: *Winkler 2433* (Bz--25401--type, N--photo of type, Z--photo of type).

VITEX VILLOSA Sim, For. Fl. & Res. Port. East Afr. 93, pl. 78B. 1909.

Literature: Sim, For. Fl. & Res. Port. East Afr. 93, pl. 78B. 1909; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 49, 66, & 85. 1928; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104 (1942) and [ed. 2], 121 & 203. 1949.

Illustrations: Sim, For. Fl. & Res. Port. East Afr. pl. 78B. 1909.

Medium-sized tree; young parts of the stem densely and closely hirsute; branches thick; leaves opposite; petioles 7—15 cm. long, pubescent; leaflets 5, sessile, obovate, 8—12 cm. long, 6-9 cm. wide, acute or obtuse at the apex, pubescent above, paler and densely villous beneath; cymes axillary, equaling the leaves, many-flowered; fruit about 2 cm. long and almost as wide, said to be edible, fleshy, set in the dilated fruiting-calyx.

The species is based on Sim 5572, said to be frequent from Quelimane northward in Portuguese East Africa, and there called "imporo". It seems very probable to me that this plant is conspecific with V. payos (Lour.) Merr., to which Pieper says it is closely related.

VITEX VOLKENSII Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895.

Synonymy: Vitex guerkeana DeWild., Ann. Mus. Congo, sér. 5 [Fl. Bas- & Moyen-Congo] 3: 129 (1909) and 467. 1912 [not V. guerkeana Hiern, 1900, nor Engl., 1916, nor H. H. W. Pearson, 1928]. Vitex discoideo-glandulosa DeWild., Plant. Bequaert. 5: 10—11. 1929.

Literature: Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 318. 1900; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 194. 1904; DeWild., Ann. Mus. Congo, sér. 5 [Fl. Bas- & Moyen-Congo] 3: 129 (1909) and 467. 1912; Prain, Ind. Kew. Suppl. 4: 248. 1913; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 42, 53, & 85. 1928; DeWild., Plant. Bequaert. 5: 10—11. 1929; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49, 50, & 104. 1942; Moldenke, Alph. List Invalid Names 53. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 62 & 88. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115, 117, 118, & 203. 1949.

Tree, shrub, or liana (?); stems subcylindric, short-pubescent and longitudinally fissured when mature, more densely tomentose and subtetragonal when young; branchlets yellowish-pubescent; leaves 3- or 5-foliolate; petioles 4—6.5 cm. long, tomentose, leaving a short spur on the branch when falling off; leaflets subsessile or distinctly petiolulate; petiolules to 13 mm. long on the central leaflets; leaflet-blades oblong or elliptic, moderately firm-textured, acute to more or less long-acuminate at the apex (the acumen subobtuse), apiculate, entire, rather long-cuneiform at the base, slightly shiny, scabrous or slightly pubescent above, slightly tomentose along the larger veins, paler and more densely pubescent or lanate beneath, with numerous discoid glands subimmersed in the lamina, the central blade 7.5—10 cm. long and to 4 cm. wide, the others distinctly inequilateral with one half of the blade ending 5 mm. above the other, 3.5—8 cm. long, 1.6—3.3 cm. wide, the lowest leaflets smallest; inflorescence terminal, branched, tomentose-velutinous, its cymes forming an ample thyrsoid panicle to 20 cm. long; pedicels to 1 mm. long, tomentose, accrescent in the fruiting stage; calyx campanulate or subcampanulate, 1.5—3 mm. long, the teeth small, deltoid, acute at the apex, much shorter than the tube; corolla white, its tube pubescent, twice as long as the calyx, the lobes small and orbicular; stamens included; fruiting-calyx cupuliform, 5—6 mm. wide; fruit subglobose, about 5 mm. wide (possibly not mature?).

The type of this species was collected by Georg Ludwig August Volkens (no. 132) — in whose honor it is named — at Nderema, Usambara, Tanganyika Territory. Pieper cites in addition Gillet 1973 and s.n. and Claessens s.n. from Belgian Congo. The species is said to inhabit gallery forests, blooming in December, and a vernacular name for it is "kasambankusu". The two Mearns collections cited below are 3-foliolate, certainly conspecific, but are placed here tentatively. They are from an altitude of 2000 meters. The species was originally described as having only 5-foliolate leaves.

V. discoideo-glandulosa was proposed by DeWildeman as a new name for his V. guerkeana when he discovered that the latter was a later homonym and therefore invalid. He cites the following collections: (1) Gillet 1973 from the vicinity of Kimuenza, Belgian Congo, collected in January, 1901, (2) Gillet s.n. from the vicinity of Léopoldville, collected in 1902, (3) Claessens s.n. from Bene-Dibele, collected in December, 1909, (4) Sapin s.n. from between Lubue and Bena-Makima, collected in May, 1910, and (5) Gillet s.n. from the right bank of the Sele at Kibimbi, collected in 1926. He states that he does not accept Pieper's fusion of this species with V. volkensii "et comme la plante que nous avons décrite est franchement occidentale, l'échantillon le plus oriental provement de Bena Dibele, à l'ouest de la région du Katanga, nous conservons séparé ce tupe....Nous attirons l'attention sur la glandulosité de la face inférieur des feuilles, caractère non signalé, et sur le pétiolule trés net des folioles, décrites pir le V. volkensii......par M. Baker comme subsessiles."

Citations: BELGIAN CONGO: Gillardin 305 (Br, Br, Br); Lebrun 6522 (Br, Br, N), 6652 (Br, Br, N, N—photo, Z—photo). TANGANYIKA TERRITORY: Scheffler 199 (N, N—photo, Po—63441); Schlieben 5910 (N, S). KENYA: Mearns 262 (W—630276), 269 (W—630284).

VITEX VONDROZENSIS Moldenke, Phytologia 4: 294—295. 1953.

Literature: Moldenke, Phytologia 4: 294—295. 1953; Harman, AETFAT Index n.p. 1954; Moldenke in Humbert, Fl. Madag. 174: 121—123 & 273, pl. 18, fig. 7 ["4"]. 1956.

Illustrations: Moldenke in Humbert, Fl. Madag. 174: pl. 18, fig. 7 ["4"]. 1956.

Tree, 5—6 m. tall; trunk about 8 cm. in diameter; branchlets and twigs very slender, grayish, very densely puberulent or short-pubescent when young, less so in age, very obtusely tetragonal; nodes annulate on older wood; principal internodes 1—5 cm. long; leaves decussate-opposite, 1-foliolate; petioles very slender or subfiliform, 5—8 mm. long, densely brown-puberulent or short-pubescent, articulate at the apex; petiolules obsolete; blades subcoriaceous, uniformly gray-green on both surfaces, elliptic, 2.5—5.5 cm. long, 0.8—2 cm. wide, long-acuminate at the apex, entire, sometimes subrevolute in drying, attenuate-acute at the base, glabrous above, very finely puberulous beneath; midrib very slender, impressed above, sharply prominent beneath; secondaries filiform, few, 4 or 5 per side, obscure or indiscernible above, very finely subprominulous beneath, plainly arcuately joined several mm. from the margins in several loops; veinlet reticulation indiscernible on both surfaces; inflorescence cymose, axillary, equaling or exceeding the subtending leaves; peduncles filiform, divergent, 1.5—2 cm. long, densely brown-puberulent or short-pubescent; cymes usually 3-flowered; pedicels filiform, 6—9 mm. long, densely brown-puberulent; bracts lanceolate, foliaceous, conspicuous, few, about 1 cm. long and 2 mm. wide, puberulent; calyx campanulate, its tube 4—5 mm. long, densely puberulent outside, the 5 foliaceous ovate-lanceolate lobes 8—9 mm. long, long-attenuate to the apex, finely puberulent on the outside; corolla very zygomorphic, red, the tube infundibular, sharply curvate, densely puberulent externally, about 3 mm. wide at the base and 7 mm. wide at the apex, 2—2.5 cm. long, the lobes very small, about 3 mm. long, obtuse; stamens short-exserted from the corolla-tube; fruiting-calyx and fruit not known.

The type of this species was collected by Raymond Decary (no. 4888) at Vondrozo, near Farafangana, Madagascar, on September 4, 1926, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. The collector records the common name "hazomamo". It is known thus far only from the original collection.

Citations: MADAGASCAR: *Decary 4888* (N—isotype, N—photo of type, P—type, Z—photo of type).

VITEX WATERLOTI Danguy, Bull. Mus. Hist. Nat. Paris 30: 508—509. 1924.

Synonymy: *Vitex waterlooti* Danguy ex Moldenke in Humbert, Fl. Madag. 174: 135, sphalm. 1956. *Vitex waterlotii* Danguy ex Moldenke in Humbert, Fl. Madag. 174: 273, sphalm. 1956.

Literature: Danguy, Bull. Mus. Hist. Nat. Paris 30: 508—509. 1924; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 79 & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 88. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123 & 203. 1949; Moldenke in Humbert, Fl. Madag. 174: 133—136 & 273, pl. 21, fig. 3—5. 1956.

Shrub or tree, 3—5 m. tall; branchlets very stout, obtusely tetragonal, often sulcate between the angles, very medullose, very densely villous-tomentose with golden or flavescent hairs, becoming more sordid-griseous in age; nodes not annulate; principal internodes 1—5 cm. long; leaf-scars large, almost circular, more or less sunken or impressed, with densely tomentose-pubescent prominent margins; leaves decussate-opposite, 5--7-foliolate; petioles very stout, 12--14 cm. long when mature, very densely villous-tomentose with golden hairs; leaflets sessile or subsessile [not petiolulate as stated by Danguy], unfolding with the flowers and mostly quite immature then, thick-textured (very conspicuously so when immature, merely thick-chartaceous in age), elliptic (not oblong as stated by Danguy), 8--20 cm. long when mature, 5--8 cm. wide when mature, mostly very obtuse or rounded at the apex when mature, rarely acute or short-apiculate, entire, revolute along the margins when mature, long-acuminate or attenuate at the base into pseudo-petioles, rather bright-green and pubescent above, very densely villous-tomentose with golden or flavescent hairs beneath, especially when young; midrib very stout on immature and on mature leaflets, impressed above and very coarsely prominent beneath, very densely villous-tomentose beneath; secondaries slender, close, regular, 15--18 per side, ascending, hardly at all arcuate, impressed above, prominent and densely golden-tomentose beneath, joined in many loops at the very margins; veinlet reticulation very abundant, rather deeply impressed above and prominent beneath; inflorescence axillary, on the youngest parts of the branchlets, appearing with the leaves, conspicuously pedunculate, the cymes many-flowered, extremely densely congested and capitate, with a Calliandra-like aspect when in anthesis, conspicuously cernuous; peduncles very stout, 2--10 cm. long, very densely villous-tomentose with golden or flavescent hairs; cymes mostly once furcate, each branch 5--10 mm. long, very stout and very densely tomentose like the peduncle, the remaining branches and pedicels suppressed, imparting a 2-headed appearance to the inflorescence; bractlets numerous, linear, stout, 10--30 mm. long, terete, very densely tomentose or lanate on both surfaces throughout, sometimes not conspicuous during anthesis but conspicuous in fruit and then surpassing the fruiting-calyx and fruit; flowers sessile; calyx campanulate, about 7 mm. long, densely lanate-tomentose with golden or flavescent hairs externally, glabrous within, the rim deeply 5-dentate or -lobed, the lobes lanceolate, unequal, about 4 mm. long, attenuate-acute at the apex; corolla tubular, slightly incurved, about 15 mm. long, glabrous at the base externally, lanuginous toward the apex, with gland-tipped hairs interspersed, glabrous within, the limb 5-lobed, the lobes ovate, 3--4 mm. long, slightly unequal, acute at the apex; stamens 4, rarely 5, about 2.5 cm. long, long-exserted and very conspicuous during anthesis; filaments subulate, glabrous, inflated and villous at the base, inserted above the lowest quarter of the corolla-tube; anthers ovate, introrse, 2-celled; pistil glabrous; style filiform, 2.5--3 cm. long, bifid at the apex; ovary globose, 4-ovulate; fruiting-cymes very densely capitate; fruiting-calyxes closely congested, densely canescent-lanate; fruit drupaceous, subglobose, about 5 mm. long and 4 mm. wide, glabrous, much wrinkled in drying.

The type of this most amazing species was collected by Georges Waterlot (no. 389) -- in whose honor it is named -- at Ambilombé, Diego Suarez, Madagascar, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. A vernacular name is "tananakomba". It is said to inhabit hills and limestone plateaus, dry hills, and tropophilous forests, at altitudes of 10 to 250 meters. It has been collected in August, December, and January.

Citations: MADAGASCAR: Humbert 18893 (P); Perrier de la Bâthie 10253 (N, P), 18784 (P); Waterlot 389 (N—photo of type, P—type, Z—photo of type).

VITEX WELLENSI DeWild., Plant. Bequaert. 5: 19—20. 1929.

Literature: DeWild., Plant. Bequaert. 5: 19—20. 1929; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 88. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 203. 1949.

Liana; branches tetragonal, glabrescent below, alate, the wings to 2 mm. wide; leaves 3-foliolate, the central leaflet somewhat larger and always longer petiolulate than the lateral ones; petioles 7.5--15 cm. long, glabrous, more or less plainly canaliculate above, subalate along the margins; petiolules 5--25 mm. long; leaflet-blades lanceolate or elliptic-lanceolate, more or less long-acuminate at the apex, entire, 15--17 cm. long, 5.5--9.5 cm. wide, glabrous and shiny above, paler and glabrous beneath but marked with very numerous subimpressed glands, the central one more or less long-cuneiform at the base, the lateral ones rounded and subcordate at the base; secondaries 6 or 7 per side; inflorescence axillary, 9--21 cm. long, the cymes spiciform, 3- or 4-flowered, lax, more or less branched, the branches tetragonal, dichotomous, to 2.5 cm. long, glabrous or very short-pubescent, the rachis subtetragonal; bractlets filiform, to 2.5 mm. long; pedicels 1--15 mm. long, sparsely short-pilosulous; calyx campanulate, 1.5--2 mm. long, sparsely pilosulous externally, its rim short-dentate or entire; corolla short-tubular, the tube about 3 mm. long, short-pubescent with glandular hairs outside, glabrous within, hairy in the throat, the limb 5-lobed, the anterior lobe cuneate, entire, about 2.5 mm. long and wide, the remainder much smaller; ovary ovoid-lageniform, glandulose and sparsely pilose at the apex; infructescence to 30 cm. long; fruiting-calyx accrescent, to 6 mm. wide; fruit subglobose, about 7 mm. long and 8 mm. wide, apiculate at the apex.

The species is based on five collections from Belgian Congo: (1) collected by Frederic Wellens (no. 110) -- in whose honor it is named — at Kanga on April 30, 1921, (2) Vermoesen 1556 from Temvo, collected June 17, 1919, (3) Vermoesen 1652 from Temvo, collected February 25, 1919, (4) Briey s.n., collected in a forest in the vicinity of Ganda-Sundi in 1903, and (5) Gillet s.n. from the region of Kisantu, collected in 1909. It is called in the vernacular "mbamba" and "nsinga-kinzinze", and is a member of the subgenus Euvitex, section Axillares, subsection Paniculatae, related to V. agelaeifolia Mildbr.

Citations: BELGIAN CONGO: Vermoesen 1652 (N—cotype, N—photo of cotype, S--cotype, Z--photo of cotype).

VITEX WELWITSCHII Gürke in Engl., Bot. Jahrb. 18: 166. 1894.

Synonymy: Vitex species arborea Welw., Apont. Phyto-geog. Angola 585. 1858. Vitex lomiensis Mildbr. in Von Mecklenb., Ergebn. Deutsch. Zentral-Afrik. Exped. 2: 80, hyponym. 1910--1911.

Literature: Welw., Apont. Phyto-geog. Angola 585. 1858; Gürke in Engl., Bot. Jahrb. 18: 166. 1894; Hiern, Cat. Afr. Pl. Welw. 4: 835. 1900; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 329. 1900; Mildbr. in Von Mecklenb., Ergebn. Deutsch. Zentral-Afrik. Exped. 2: 80. 1910--1911; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 50, 69, & 85. 1928; DeWild., Plant. Bequaert. 5: 20--21. 1929; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48, 49, 51, & 104. 1942; Moldenke, Alph. List Invalid Names 54. 1942; Robyns, Fl. Sperm. Parc Nat. Albert 2: 140--141. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 89. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 114, 115, 119 & 203. 1949.

Small tree or shrub, 3--6.5 m. tall; branches short-pubescent; leaves 5-foliolate; petioles 5--7.5 cm. long; petiolules short; leaflet-blades moderately firm or rigid, obovate-cuneate, conspicuously cuspidate at the apex, entire, green and glabrous above when mature, finely pubescent beneath, the central one 7.5-10 cm. long and 3.7--5 cm. wide; cymes axillary, dense, many-flowered, short-pedunculate; calyx campanulate, about 2 mm. long, densely pubescent, its teeth 1--2 mm. long; corolla small, violet or mauve-white; ovary elongate, pubescent-glandulose; fruit axillary, green, long-pedicellate, spherical but laterally compressed, about 3 cm. long and 2.5--3 cm. wide.

The type of this species was collected by Frederich Martin Joseph Welwitsch (no. 5644) -- in whose honor it is named -- in the province of Golungo Alto, Angola. It is said to be found in climax coastal bushland with Spirostachys, Pteleopsis, Croton, Acacia, and much Usnea, as well as in open forests at 4000 feet altitude. It has been collected in flower in February and March, and in fruit in May and July. It has been confused in the past with and misidentified as V. milanjiensis Britten and V. grandifolia var. bipindensis (Gürke) Pieper. Robyns cites in addition Mildbraed 2731 from Semliki plain, collected in February, 1908, while Pieper cites this and also Mildbraed 5329 and 8753 from Lombie and Dendeng and Schlosser 11 from Lombie, Cameroons.

Citations: BELGIAN CONGO: Louis 11490 (N, S); Quarré 1203 (Br). TANGANYIKA TERRITORY: Pole-Evans s.n. (N--photo). NORTHERN RHODESIA: Herb. Queen Victoria Memorial 8322 (N, Rh); Pole-Evans 2886 [43] (Rh), 3043 [50] (Rh). SOUTHERN RHODESIA: N. C. Chase 4191 [Govt. Herb. Salisbury 35449] (Bm, N). PORTUGUESE EAST AFRICA: Lourenço Marques: Hornby 2526 (N, Rh--515147).

VITEX WELWITSCHII var. LAURENTII (DeWild.) Pieper in Engl., Bot.

Jahrb. 62, Beibl. 141 ["142"]: 69--70. 1928.

Synonymy: *Vitex laurentii* DeWild., Etud. Pl. Bas- & Moyen-Congo 4: 129 (1909) and 255. 1910. *Vitex bracteosa* Mildbr. in Von Mecklenb., Ergebn. Deutsch. Zentral-Afrik. Exped. 2: 62, hyponym. 1910--1911.

Literature: DeWild., Etud. Fl. Bas- & Moyen-Congo 4: 129 (1909) and 255. 1910; Mildbr. in Von Mecklenb., Ergebn. Deutsch. Zentral-Afrik. Exped. 2: 62. 1910--1911; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 69--70 & 85. 1928; DeWild., Plant. Bequaert. 5: 20--21. 1929; Moldenke, Alph. List Invalid Names 52 & 53. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48, 49, & 104. 1942; Robyns, Fl. Sperm. Parc Nat. Albert 2: 141. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 68. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 114, 115, & 203. 1949.

This variety differs from the typical form of the species in its more lax inflorescences, which have mostly narrower bractlets on their uppermost branches and which are located in the axils of the young leaves as well as of the old already-shed leaves, while in the typical form they are located only on the young parts of the branches or are only singly scattered below.

The variety is not, in my opinion, a very distinct one and should perhaps be reduced to synonymy under the typical form of the species, as suggested by DeWildeman in 1929. It is said to be a large or small tree, with a short trunk 60--80 cm. in diameter and 1.5 meter in circumference; the wood very durable and little attacked by termites; the corolla violet or pale yellowish-white; and the fruit edible. It inhabits forests, riverbanks, and the margins of water, and has been collected in February to April, November, and December. DeWildeman reports that "l'écorce est utilisée pour la préparation de lavements. Le bois sert à faire des pilons". Vernacular names include "djoanga", "ekulakwale", "linguengue", "momposo", "ngunge", "n'gungu", and "nungu".

Pieper cites *Mildbraed 4600* from Cameroons and *Laurent 1921*, *Pynert 657*, *1046*, and *1229*, and *Seret 885* from Belgian Congo. De Wildeman cites *Bequaert 1245* and *2432*, *Bonnivair 5*, *Broun s.n.*, *Claessens 374*, *460*, and *512*, *De Giorgi 1801*, *Goossens 4741*, and *Mortehan 1020* from Belgian Congo.

VITEX WILMSII Gürke, Notizbl. Bot. Gart. Berlin 3: 76. 1900.

Literature: Gürke, Notizbl. Bot. Gart. Berlin 3: 76. 1900; H. H. W. Pearson in T iselt.-Dyer, Fl. Cap. 5: 212 & 216--217. 1901; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 53, 74, & 85, pl. 10 & 11. 1928; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 89. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 122 & 203. 1949.

Illustrations: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 10 & 11. 1928.

Large shrub or small tree, to 2.7 m. tall; branches terete, densely lanate-tomentose; leaves decussate-opposite, 3--5-foliolate; petioles stout, 2--5 cm. long, densely lanate-tomentose;

leaflets sessile or short-petiolulate, the blades subcoriaceous, ovate or elliptic, 4.5—11 cm. long, 2—6 cm. wide, varying from short-acuminate or acute to obtuse at the apex, entire, sinuate and ciliate along the margins, cuneate or somewhat rounded at the base, puberulent or pubescent above, more or less lanate-tomentose along the midrib and secondaries beneath, otherwise puberulous or glabrous and profusely glandulose beneath; secondaries 7-10 per side, impressed above, prominent beneath; cymes axillary, divaricate, not surpassing the leaves, bracteate, the branches lanate-tomentose; peduncles 4--8 cm. long, lanate-tomentose; bractlets linear or linear-oblong, more or less falcate, acute at the apex, narrowed at the base, puberulent or pubescent, the lower ones 6--12 mm. long; pedicels short, bearing 2 prophylla; calyx campanulate, its tube prominently 10-veined, 3—3.5 mm. long, pubescent and profusely glandulose outside, glabrous within, the limb spreading, 5-lobed, the lobes broad, rounded and apiculate or subdeltoid and acute, about 1.5 mm. long and 2 mm. wide, pubescent and glandulose, the margins ciliate; corolla white, its tube about 6 mm. long, glabrous externally on the lower portion, pubescent and glandulose above, pubescent in the throat, the lobes reflexed, pubescent and profusely glandulose on the outer surface, glabrous within, the margins ciliate; stamens inserted at the middle of the corolla-tube, short-exserted; filaments dilated and villous toward the base; fruit drupaceous, obconic, about 6 mm. long and 3--4 mm. wide at the apex, shorter than the accrescent calyx, glabrous below, pubescent and glandulose above.

The species is based on F. Wilms 158 and 159 -- in whose honor it is named -- from near Lydenburg, Transvaal. It is said to be found in marginal bushveld, on rocky or wooded hillsides, and on the top of rather exposed mountain ridges, at altitudes of 2000 to 6000 feet, blooming in November, and fruiting in June. Pieper cites, in addition, Wilms 1249. It has been confused in the past with V. pooara Corbishley.

Citations: SWAZILAND: Codd 4734 (Z). UNION OF SOUTH AFRICA: Cape of Good Hope: J. P. H. Acocks 13419 (Cb). Transvaal: Barnard & Mogg 761 (N); C. E. Gray 4187 (Af, N--photo, Z--photo); Meeuse 9325 (Ss); Thorncroft 13 [Herb. Wood 4156] (N, N--photo, Na—4685, Na—4686, Z--photo); Miss Williams s.n. [XI.1909] (Cb).

VITEX WILMSII var. REFLEXA (H. H. W. Pearson) Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 74. 1928.

Synonymy: Vitex reflexa H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 215--216. 1901.

Literature: H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 212 & 215—216. 1901; E. E. Galpin, Bot. Surv. S. Afr. Mem. 7: 23 & 25, fig. 50. 1925; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 74 & 85. 1928; O. B. Mill., Tydskrif van Suid-Afric. Bosbouver. 6: 93 & 95. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104. 1942; Moldenke, Alph. List Invalid Names 55. 1942; Moldenke, Phytologia 2: 123. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 121, 122, &

203. 1949.

Illustrations: E. E. Galpin, Bot. Surv. S. Afr. Mem. 7: fig. 50. 1925.

This variety differs from the typical form of the species only in the less dense pubescence on its leaflets.

It is a shrub 2.5 m. tall or a tree 3--10 m. tall, the trunk 22.5--30 cm. in diameter; wood grayish-yellow, very hard or of medium hardness and weight, the grain straight and, though somewhat short, of fair strength, working easily, taking a good finish, not attacked by termites after being properly seasoned; branches subterete, hollow, finely tawny-tomentose, with light and striate lenticellate bark when mature and very prominent leaf-scars; leaves opposite or subopposite, 5-foliolate; petioles 4--5 cm. long, finely tomentose; petiolules 2--10 mm. long, canaliculate, tomentose; leaflet-blades membranous, oblong-elliptic or obovate, 5.5--8.5 cm. long, 2.5--4 cm. wide, subacute or obtuse at the apex, entire, with slightly thickened pubescent margins, cuneate at the base, profusely glandulose, glabrescent and dark-brown in drying above, pubescent (especially along the midrib and secondaries) and lighter in color beneath; secondaries 8--12 per side, impressed above, prominent beneath; cymes axillary, pedunculate, divaricate, about as long as the subtending leaves, bracteolate, finely tomentose; peduncles flattened, 5--6 cm. long; bractlets linear-oblong or elliptic, about 10 mm. long, acute at the apex, attenuate at the base, puberulent; flowers short-pedicellate, bracteolate, 8--10 mm. long; calyx campanulate, its limb spreading, subequally 5-lobed, its tube about 4 mm. long, 10-veined, glabrous within, profusely glandulose and minutely pubescent outside, the lobes short, broadly ovate, about 2 mm. long, 2.5--3 mm. wide, acute at the apex, with prominent reticulate venation, profusely glandulose, pubescent; corolla mauve or pale-mauve, its tube glabrous below, minutely pubescent and profusely glandulose above the middle on the outside, with a ring of hairs about the middle and pubescent above in the anterior portion within the tube, the lobes strongly reflexed, finely pubescent and profusely glandulose; stamens inserted at about the middle of the corolla-tube, short-exserted; filaments broader and villous toward the base; ovary subglobose, pubescent and glandulose above the middle; fruit drupaceous, obconic, shorter than the accrescent fruiting-calyx, about 4 mm. long and 3 mm. wide near the apex, light-colored, glandulose, pubescent on the upper part.

The type of this variety was collected by Ernest Edward Galpin (*no. 602*) in dongas around Barberton, Transvaal, Union of South Africa, at an altitude of 2800 feet. It is said to inhabit savanna-woodland and sandy loam, at altitudes of 2300 to 3100 feet, blooming in November and December. Common names are "ama-kosikati," "manohani", "mokoele", "pyp steel", and "pypsteel". It has been confused in the past with *V. mooiensis* var. *rudolphi* H. H. W. Pearson. Galpin says of his *no. 282m*: "closely related to *V. reflexa*.....and probably a new species.....abundant and increasing in the sand veld, to which it is strictly confined.....owing to the many stronger timbers available, it is little used locally, but should be useful for general purposes. Used by natives for stools. The young twigs have hollow stems and are used as stems for tobacco pipes, hence the local name 'pypsteel'....wood used for hammers, handles, etc."

Citations: SWAZILAND: *Codd 4734* (Rh); *H. E. Hornby 2802* (N); *O. B. Miller S.254* (Z). UNION OF SOUTH AFRICA: Transvaal: *E. E. Galpin 282m* (Gg--208426, N), *602* (N--isotype, N--photo of type, Na--8741--type, S--photo of type, Z--photo of type); *F. A. Rogers 24065* (S), *25027* (S).

VITEX WIMBERLEYI Kurz, For. Fl. Brit. Burma 2: 271. 1877.

Literature: Kurz, For. Fl. Brit. Burma 2: 271. 1877; Jacks., Ind. Kew. 2: 1214. 1895; Moldenke, Known Geogr. Distrib. Verbenac, [ed. 1], 56 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 89. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 129 & 203. 1949.

Small evergreen tree much resembling *V. sumatrana* Miq.; young shoots puberulent; leaves 3--5-foliolate; petioles slender, 5--7.5 cm. long, glabrous; leaflets petiolulate or the basal ones subsessile; leaflet-blades chartaceous, elliptic-oblong to lanceolate, acuminate at the apex, coarsely crenate-serrate, asymmetric and acute at the base, glabrous, glossy; petiolules slender, glabrous; flowers small, sessile or subsessile, clustered or cymulose, forming puberulent loosely bracteolate panicles at the ends of the branches and in the axils of the upper leaves; bracts caducous, the lowest ones diminutively foliaceous, the upper ones linear-oblong and grading into the linear-lanceolate acute bractlets which are about as long as the calyx; calyx about 4 mm. long, velvety, the rim truncate and broadly toothed; corolla pubescent on the outside, its tube short and wide, the lobes blunt, the lowermost much produced.

The species inhabits the tropical forests of the Andaman Islands, flowering in the rainy season. No specific type specimens are cited by the author.

VITEX YAUNDENSIS Gürke in Engl., Bot. Jahrb. 33: 296--297. 1904.

Synonymy: *Vitex yaundense* Gürke ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104, sphalm. 1942.

Literature: Gürke in Engl., Bot. Jahrb. 33: 296--297. 1904; Prain, Ind. Kew. Suppl. 3: 189. 1908; Mildbr. in Von Mecklenb., Ergebn. Deutsch. Zentral-Afrik. Exped. 2: 90. 1910--1911; Wheeler, Bull. Am. Mus. Nat. Hist. 45: 446--447. 1922; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 46, 59, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 203. 1949.

Tree, 6--8 m. tall; branches tetragonal, glabrous; leaves 5-foliolate; petioles 15--22 cm. long, canaliculate above, glabrous; petiolules 1--2 cm. long; leaflet-blades herbaceous, oblong-ovate, long-acuminate at the apex, entire, narrowed at the base into the petiolule, glabrous on both surfaces, the central one to 24 cm.

long and 9 cm. wide, the lateral ones to 20 cm. long, and the basal ones to 14 cm. long and 7 cm. wide; secondaries very numerous, to 25 in number, parallel; inflorescence in the axils of the upper leaves, composed of loose dichasia with very long branches; peduncles 16--20 cm. long; bractlets sessile, linear, long-acuminate at the apex, finely pubescent, the lower ones to 15 mm. long, the upper ones much shorter; pedicels 2--3 mm. long, finely pubescent; calyx turbinate, about 3 mm. long, pubescent, its rim 5-toothed, the teeth deltoid, 1 mm. long and about as wide at the base, rather acute at the apex; corolla greenish-yellow, its tube very stout, only 4 mm. long, the limb plainly 2-lipped and 5-lobed, the 2 posterior lobes ovate, about 1 mm. long, obtuse at the apex, and pubescent, the 2 side lobes of the same shape and pubescence as the posterior ones but 2 mm. long, the anterior lobe violet, spatulate, about 4 mm. long, somewhat emarginate at the apex, pilose at the base and on a mid-line, otherwise glabrous.

The type of this species was collected by Georg August Zenker (*no. 1412*) in the virgin forest at Yaunda Station, at an altitude of 800 meters, Cameroons, in June, 1897. Pieper also cites *Mildbraed 5607* from the forests of southern Cameroons. Wheeler reports that the stems of this species are infested by ants, probably *Viticicola tessmanni* (Stitz). The species belongs in subgenus *Euvitex*, section *Axillares*, subsection *Cymosae*, grex *Glandulosae*, group *Eutriches*, subgroup *Griseae*, and secondary subgroup *Parallelae*. It is related to *V. grandifolia* Gürke, but differs in its sparse and lax inflorescences and very numerous secondary veins. The nodes of the branches and branchlets usually have the characteristic round holes indicating myrmecophily.

Citations: CAMEROONS: *Zenker 1412* (N--isotype, N--photo of isotype, S--isotype, Z--photo of isotype). BELGIAN CONGO: *Delevoy 706* (Br).

VITEX YUNNANENSIS W. W. Sm., Not. Bot. Gard. Edinb. 9: 141--142. 1916.

Literature: W. W. Sm., Not. Bot. Gard. Edinb. 9: 141--142. 1916; Hand.-Mazz., Symb. Sin. 7: 906. 1936; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 57 & 104. 1942; P'ei, Bot. Bull. Acad. Sin. 1: 5. 1947; Hill & Salisb., Ind. Kew. Suppl. 10: 244. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 133 & 203. 1949.

Shrub 1--5 m. tall; branchlets at first tomentellous with yellow-glanduliferous hairs, later glabrescent and cinereous; leaves 3- [rarely 5-] foliolate; petioles 1.5--3 cm. long, fulvous-tomentellous; leaflets unequal, the terminal one larger and on a petiolule about 2 mm. long, the lateral ones very short-petiolulate, the basal ones smallest; leaflet-blades papyraceous, ovate, rather obtuse at the apex, entire or sometimes coarsely few-sinuate or even lobed, broadly cuneate or rounded at the base, ciliolate along the margins, dark-green above and sparsely pilosulous on the veins or often short-strigillose and with scattered shiny-yellow glands above, fulvous beneath, densely white-pilose along the midrib and secondaries or sometimes very shortly crisped-pilose on the midrib beneath, the remainder almost glabrous, glandulose, the central ones 3--6.5 cm. long and about 2 cm. wide; inflorescence axillary, the cymules 3--7-flowered; peduncles to 1 cm. long, white-pilose and densely glandulose; pedicels 2--3 mm. long, white-pilose and densely glandulose; bractlets linear, scarcely 1 mm. long, white-pilose and densely glandulose; calyx campanulate, about 3 mm. long, white-pilose, glandulose, its rim 5-toothed, the teeth broadly triangular, scarcely 0.5 mm. long, obtuse at the apex; corolla white, often tinged with rose or blue, to 17 mm. long, its tube almost 10 mm. long, slightly incurved, slightly dilated above, puberulent on the outside, densely white-pilose at the insertion of the stamens inside, the lobes unequal, rounded at the apex, glandulose externally, glabrous within, the anterior lobe about 7 mm. long; filaments white-pilose at the base, glabrous above; ovary 2--4-celled; fruiting-calyx almost 1 cm. wide; fruit drupaceous, globose, about 10 mm. wide, with a bony endocarp.

The species is based on G. Forrest 10100 from open scrub on the descent to the Yangtze River from the eastern boundary of the Lichiang Valley, Yünnan, China, at about latitude 27°15' N., at an altitude of 9000 to 10,000 feet, in June, 1913, and on G. Forrest 12471 from open dry situations in the Feng Kow Valley, Yünnan, at about latitude 27°40' N., at an altitude of 8000 feet, in June, 1914. Smith also cites Forrest 10719, 10819, and 11349 as probably belonging to this species, although the first of these has larger and less hairy leaves. The species is related to V. vestita Wall. It has been collected in flower from May to August, and in fruit in July and September. It inhabits grassy flats in alpine areas, at altitudes of 1500 to 3500 meters. P'ei records it from Sikiang.

Citations: CHINA: Szechuan: Handel-Mazzetti 2460 (N); Rock 16128 (N), 17805 (N), 23725 (N), 24298 (N); H. Smith 10266 (Go). Yünnan: Forrest 11349 (N--photo).

VITEX ZANZIBARENSIS Vatke, Linnaea 43: 533. 1882.

Literature: Vatke, Linnaea 43: 533. 1882; Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 318. 1900; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 41, 53, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50 & 104 (1942) and [ed. 2], 117 & 203. 1949.

Shrub, 4--5 m. tall; branchlets short-pubescent; leaves 3--5 foliolate; petioles 4--5 cm. long; leaflets sessile, the blades moderately firm, oblong-lanceolate, 7.5--10 cm. long, about 2.5 cm. wide at the middle, acuminate at the apex, entire, narrowed to the base, green and glabrous on both surfaces; cymes laxly disposed on the branches of an ample panicle, the branchlets covered with a short whitish pubescence; bractlets lanceolate, minute; calyx campanulate, about 2 mm. long and wide at time of anthesis, canescent, its rim 5-toothed, the teeth minute; corolla lilac, about 6 mm. long, its tube infundibular, the lobes very small.

The type of this species was collected by Johann Maria Hildebrandt (no. 1303) at Bagamoyo, Tanganyika Territory. Pieper cites in addition Holtz 1096 and Martin 3133 from Tanganyika.

VITEX ZENKERI Gürke in Engl., Bot. Jahrb. 33: 293. 1904.

Literature: Gürke in Engl., Bot. Jahrb. 33: 293. 1904; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 43, 57, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 90. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 114 & 203. 1949.

The species is based on two collections of Georg August Zenker -- in whose honor it is named -- his nos. 839 and 1545 from the Cameroons. Pieper cites in addition Lotz 136 and Zenker 1006 from the same area.

Citations: CAMEROONS: Zenker 139 (Gg--151106), 839 (S--cotype), 1545 (N--photo of cotype, S--cotype, Z--photo of cotype), 4843 (Br, Br, N, S), 5315 (Gg--245945, N), s.n. [May 1896] (N). BELGIAN CONGO: Delevoy 653 (Br).

VITEX ZEYHERI Sond. ex Schau. in A. DC., Prodr. 11: 693. 1847.

Literature: Schau. in A. DC., Prodr. 11: 693. 1847; Kuntze, Rev. Gen. Pl. 3 (3): 258. 1898; H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 212 & 216. 1901; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 53, 74, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 90. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 121, 122, & 203. 1949.

Tree, about 3.2 m. tall; bark rough, black; branches terete, densely covered with a light tawny tomentumç leaves opposite or subopposite, 3--5-foliolate; petioles 2--4 cm. long, tomentose; leaflets sessile or subsessile; leaflet-blades coriaceous, oblong or oblong-lanceolate, 4.5--7.5 cm. long, 1.4--3.2 cm. wide, acuminate or shortly acute to rounded at the apex, entire, cuneate at the base, canescent, densely glandulose; secondaries 8--13 per side, obscure; cymes axillary, divaricate, equaling or slightly surpassing the subtending leaves, bracteate, densely and finely tomentose; peduncles flattened, 3--5 cm. long, tomentose; bracts linear-subulate or narrow-spatulate, canescent, the lower ones 6--12 mm. long; calyx campanulate, its tube about 4 mm. long, 10-veined, finely tomentose and glandulose externally, glabrous within, the limb 5-lobed, the lobes broadly ovate, 1--1.5 mm. long, acute at the apex, spreading, tomentose, glandulose; corolla-tube straight, about twice as long as the calyx, pubescent and densely glandulose externally, villous within above the insertion of the stamens, the lobes pubescent; stamens inserted at or below the middle of the corolla-tube, short-exserted; filaments villous toward the base; ovary globose, pubescent, glandulose; fruit drupaceous, obconic, about 3 mm. long, 2--3 mm. wide, shorter than the accrescent spreading fruiting-calyx, minutely pubescent and glandulose.

The type of this species was collected by Carl Ludwig Philipp Zeyher (*no. 73*) — in whose honor it is named — on the banks of the Crocodile River, Transvaal, Union of South Africa. This is, however, probably the same collection which is labeled "*Burke 73*" in the Kew and British Museum herbaria and which agrees very closely with Schauer's description. Burke and Zeyher visited the Magalies Berg together and may sometimes have used the same numbers. The species has been found on quartz conglomerate, on river banks, and is said to be dominant on steeper slopes. It has been collected at an altitude of 3200 feet, in flower in November, and in fruit in April. Specimens have been misidentified in herbaria as "*V. rehmannia* Gürke" and as *Clerodendron* sp., as well as the following variety. Pearson cites, in addition, two *Holub s.n.* collections from Bechuanaland Protectorate.

Citations: UNION OF SOUTH AFRICA: Cape of Good Hope: *Wahlberg s.n.* (S, S). Transvaal: *J. Burk s.n.* [Magalies-Berg] (N); *Codd 1167* (Ss); *R. Leendertz 932* (Na--15691); *Mogg & Phillips s.n.* [6.4.35] (Ss); *Nickerk & Wassfall 19* (N, Rh); *A. A. Obermeyer s.n.* [Herb. Transvaal Mus. 35150] (N, N--photo, Na--27617, S--photo, Z--photo); *Pole-Evans H.18060* (Z); *F. A. Rogers 20377* (S); *Scott Elliot 1492* (C); *J. Thode A.1484* (Na--24887), *s.n.* [Zeerust, Dec. 1927] (Na--18309); *Wahlberg s.n.* [Jan. 1842] (S).

VITEX ZEYHERI var. BREVIPES H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 216. 1901.

Literature: H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5:216. 1901; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 74 & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104 (1942) and [ed. 2], 122 & 203. 1949.

This variety differs from the typical form of the species in having the petiolules 2--6 mm. long and canescent and the leaflet-blades 4--5 cm. long and 8--16 mm. wide.

The variety is based on two collections, one by Carl Philipp Zeyher (*no. 1369*) from the northern slopes of the Magalies Berg, near the Crocodile River, Transvaal, Union of South Africa, and the other by J. Burke (*s.n.*) from near the Aapies River, Transvaal. The Kew specimens, which alone were examined by Pearson, are in an immature state of development. Therefore Pearson notes that "more advanced material may justify its separation as a species."

Citations: UNION OF SOUTH AFRICA: Transvaal: *J. Burke s.n.* [Aapies River] (N--cotype); *Zeyher 1369* (S--cotype).

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THE GENUS *CASTELIA*

Harold N. Moldenke

This is the eighteenth in my series of monographic treatments of the genera of *Verbenaceae*. Previously published treatments have been of the genera *Aegiphila* Jacq., *Amasonia* L. f., *Baillonia* Bocq., *Bouchea* Cham., *Casselia* Nees & Mart. [*Timotocia* Moldenke], *Chascanum* E. Mey., *Cornutia* Plum., *Petitia* Jacq., *Petrea* Houst., *Priva* Adans., *Recordia* Moldenke, *Rehdera* Moldenke, *Rhaphithamnus* Miers, *Svensonia* Moldenke, *Tectona* L. f., and *Vitex* Tourn., and the New World and cultivated representatives of *Callicarpa* L.

A full explanation of the abbreviations employed for the names of herbaria in this series of papers will be found in Phytologia 5: 154--159 (1955).

CASTELIA Cav., Anal. Cienc. Nat. Madrid 3: 134, pl. 30, Icon. & Descr. 6: 60, pl. 583. 1801 [not *Castelia* Liebm., 1853, nor *Castela* Turp., 1806, nor *Castellia* Tin., 1817].

Synonymy: *Cartelia* Cav. apud C. Gay, Hist. Fis. Chile Bot. 5: 7, sphalm., in syn. 1849. *Pitraea* Turcz., Bull. Soc. Imp. Nat. Mosc. 35 (2): 328--329. 1862. *Phelloderma* Miers, Trans. Linn. Soc. Lond. Bot. 27: 100. 1870. *Priva* Juss. ex Miers, Trans. Linn. Soc. Lond. Bot. 27: 100, in syn. 1870 [not *Priva* Adans., 1763]. *Bouchea* Gay ex Miers, Trans. Linn. Soc. Lond. Bot. 27: 100, in syn. 1870 [not *Bouchea* Cham., 1832].

Literature: Cav., Anal. Cienc. Nat. Madrid 3: 134--135, pl. 30. 1801; Cav., Icon. & Descr. 6: 60--61, pl. 583. 1801; A. L. Juss., Ann. Mus. Hist. Nat. Paris 7: 70. 1806; Pers., Syn. Pl. 2: 139. 1807; Hook., Bot. Misc. 1: 172. 1829; R. Graham, Edinb. N. Phil. Journ. 29: 174. 1840; Walp., Repert. 4: 36. 1846; Schau. in A. DC., Prodr. 11: 533 & 556. 1847; C. Gay, Hist. Fis. Chile Bot. 5: 7 & 26--27 and Atlas 1: pl. 55. 1849; Bocq. in Baill., Adansonia 3: 236. 1863; Turcz., Bull. Soc. Imp. Nat. Mosc. 35 (2): 328--329. 1862; R. A. Phil., Anal. Univ. Chil. 35: 193. 1870; Miers, Trans. Linn. Soc. Lond. Bot. 27: 100--102 & 109, pl. 27. 1870; Lorentz, Veg. Nordeste Prov. Entre Ríos 150. 1878; Griseb., Symb. Fl. Argent. 275. 1879; F. Philippi, Cat. Pl. Vasc. Chil. 217. 1881; Gartenfl. 32: pl. 1131. 1883; Jacks., Ind. Kew. 2: 493. 1894; Rusby, Bull. Torrey Bot. Club 27: 80. 1900; Reiche, Fl. Chil. 5: 304--305. 1910; Hicken, Chloris Plat. Argent. 199. 1910; Anal. Soc. Cient. Argent. 88: 95--134. 1919; Sanzin, An. Soc. Cient. Argent. Buenos Aires 88: 106. 1919; Grenz., Ann. Mo. Bot. Gard. 13: 74 & 88. 1926; Kobuski, Ann. Mo. Bot. Gard. 13: 6, 16--17, pl. 4, fig. 12, & pl. 5, fig. 21. 1926; Seckt, Rev. Univ. Nac. Cordoba 17: 87 & 90. 1930; Junell, Symb. Bot. Upsal. 4: 39--43, figs. 73, 74, & 77--79. 1934; Dahlgren, Svensk. Bot. Tidsk. 32: 231. 1938; Moldenke, Alph. List Common Names 10 & 24. 1939;

Moldenke, Geogr. Distrib. Avicenn. 1, 25, 28, 29, & 36. 1939; Moldenke, Prelim. Alph. List Invalid Names 7, 35, 36, & 38. 1940; Moldenke, Lilloa 6: 314--316. 1941; Moldenke, Suppl. List Invalid Names 2. 1941; Moldenke, Alph. List Invalid Names 6, 12, 36, & 39. 1942; Moldenke, Lilloa 8: 414. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34, 36, 40, 42, 71, & 87. 1942; Bol. Mus. Hist. Nat. Jav. Prado 7: 244. 1943; Moldenke, Phytologia 2: 95. 1944; Moldenke, Lilloa 10: 339--340 & 369. 1944; Moldenke, Bot. Gaz. 102: 162. 1944; Moldenke, Holmbergia 4: 149. 1945; Moldenke, Alph. List Cit. 1: 16, 28, 30, 39, 59, 76, 83, 95--97, 104, 105, 112, 114, 117, 118, 136, 147, 201, 217, 235, 266, 274, 275, 313, 321, & 326. 1946; Lorentz, Veg. Nordeste Prov. Entre Ríos, repr. ed., 150. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 2 & 19. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 31, 53, & 76. 1948; Moldenke, Alph. List Cit. 2: 338, 358, 371, 372, 373, 377, 379, 381, 407, 423--426, 430, 434, 435, 438--442, 500, 537, 561, 564--567, 575, 580, 593, 598--600, 613, 617, 626--628 (1948), 3: 662, 663, 672, 673, 703, 728, 731, 732, 735--737, 746, 767, 784, 812, 838, 843, 848, 859, 864, 865, 868, 880, 884, 893, 903, 911, 913, 931, & 940 (1949), and 4: 979, 980, 983, 1010, 1013, 1036, 1043, 1044, 1049, 1050, 1056, 1062, 1070, 1075, 1078, 1088, 1090, 1091, 1115, 1120, 1138, 1192, & 1302. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 71, 75, 96, 100, 103, 157, & 178. 1949; Ragonese, Revist. Investig. Agric. 6: 81. 1951; Moldenke, Phytologia 4: 451. 1953.

Perennial herbs, mostly of very arid areas, mostly 30--50 cm. tall, mostly glabrous below and minutely puberulent above, erect, often branched at or near the base, often stoloniferous; roots fibrous, producing fusiform tubers deep in the soil; branches decussate-opposite, tetragonal; leaves decussate-opposite, petiolate, mostly ovate or obovate, cuneately narrowed into the petiole at the base, obtuse at the apex, coarsely crenate or dentate along the margins, the teeth apiculate; inflorescence terminal, spicate, simple, many-flowered; flowers sessile or short-pedicellate, the upper ones mostly verticillate, the lower ones often scattered-solitary, all bracteolate; calyx cylindric-tubular, 5-striate or 5-costate, the rim 5-fid, the teeth unequal, linear-acuminate or acute, erect, the posterior one shorter; corolla hypocrateriform, zygomorphic, varying from white to various shades of pink, mauve, lilac, or purple, the tube cylindric or infundibular, about 1 1/2 times the length of the calyx, curvate or oblique, truncate at the apex, plicate within, the veins straight, expanded at the mouth into an oblong-annular oblique limb, the limb bilabiate or subbilabiate, the upper lip 2-lobed, the lower lip much larger and 3-lobed, the lobes unequal, ovate, rounded, the 2 posterior ones shorter and more erect, the anterior one longer and broader, the 2 intermediate ones subreflexed, somewhat smaller, and undulate-margined; fertile stamens 4, didynamous, the 2 upper ones anterior and inserted below the mouth of the corolla-tube, the 2 lower ones posterior and inserted at the middle of the corolla-tube, the fifth represented by a sterile staminode; filaments long or short, slender, pilosulous, somewhat longer than the anthers; anthers oblong, 2-lobed, cordate or sagittate to the middle, equaling or scarcely surpassing the corolla-tube, laterally compressed, 2-celled, attached by a slender connective at the sinuses, dehiscing by means of a longitudinal slit on both sides, introrse; pollen-grains globose, reticulate; staminode 1, anantherous, shorter and inserted somewhat lower than the stamens; style filiform, equaling the corolla-tube, gradually dilated and compressed at the apex; stigma rather large, abruptly uncinate-recurved, mucronate, bilamellately compressed, papillose on the inner surface; ovary subcylindric or conic-oblong, situated on a glandular disk, 2--4-celled, with a dissepiment directed toward the axis of the inflorescence and 2-lamellate, the lamellae distinctly separated; ovules usually 4, erect; fruiting-calyx distended, including the fruit, terminated by contorted-plicate teeth; fruit drupaceous, included by the mature fruiting-calyx, ovate, apiculate, smooth, scarcely striate, indehiscent, 2-celled, the cells covered by a dorsal thick and somewhat corky mesocarp, surrounded along the margins, at the cuneate-acuminate apex, and at the hollow base by a thick pith; nutlets (pyrenes) 2, immersed in and about half as long as the cells, ovate, plano-convex, deeply 9-sulcate on the outside, with the channels filled by mesocarp, 2-sulcate within, osseous, each 2-locular, the locelli perforated at the base by nutritive vessels; columella central, thin-membranous, empty, adnate, forming the vessel leading to the seeds; seeds solitary in each locellus, oblong, subterete, erect, attached at the extero-basal angle by a short funiculus; integument very thin; raphe lateral, ascending to the apical chalaza; embryo included in a sparse albumen, linear-cylindric; cotyledons 2, twice as long as the inferior radicle.

A monotypic genus native to Peru, Bolivia, Argentina, and Chile; cultivated and introduced elsewhere. It is named in honor of Juan de Dios Castel, Spanish companion of Loefling on his trip of exploration up the Río Orinoco and concerning whom not much is known. *Pitraea* was named in honor of Adolf Samoilovic Pitra (1830--1889), Russian professor of botany at the University of Kharkov, noted for his work in plant physiology. It was based on *P. chilensis* Turcz., and was said by Turczaninow to resemble the genera *Mimulus* L. and *Diplacus* Nutt. in the *Scrophulariaceae*, which is true in a general superficial way. The genus *Phelloderma* was based on *Priva laevis* A. L. Juss., and the name is derived from   , cork, and   , skin, from the suberous covering in which the nutlets are embedded. The original publication of *Pitraea* is often given erroneously as "36 (2)", and that of *Phelloderma* as "27 (2). 1871."

It has been pointed out by Miers and others that this genus differs from *Priva* in the following respects: (1) the calyx does not become globosely expanded in fruit, (2) the corolla-tube has straight, not twisted, veins, (3) the corolla-limb is usually distinctly bilabiate, (4) the anthers are cordate or sagittate to the middle, (5) there is a fifth stamen represented by a sterile staminode, (6) the stigma is simple and uncinate, (7) the fruit is drupaceous, oval, apiculate, and smooth, (8) the nutlets ("nucules") do not separate spontaneously at maturity because of the somewhat suberose mesocarp which firmly holds them together, (9) the nutlets are borne in an "antical and postical" position, (10) there is a copious pithy ring surrounding the nutlets, (11) the nutlets are osseous, not testaceous, deeply furrowed on the back, not spinose, and (12) the seeds have a distinct, although thin, albumen. It differs from *Bouchea* (1) in having the longer tooth of the calyx posterior, not anterior, (2) in having a fifth stamen represented by a sterile staminode, (3) in the ovalm not linear, shape of the nutlets, which are osseous and deeply furrowed dorsally, rather than smooth and thin-testaceous, (4) in the nutlets not separating spontaneously and being surrounded by a large pointed pithy ring double their length, (5) by the presence of albumen in the seeds, and (6) by the nutlets being 2-locular, not unilocular.

The generic name *Castellia* Tin., referred to above, is a synonym of *Festuca* L. in the *Poaceae*, while *Castelia* Liebm. and *Castela* Turp. are synonyms of *Neocastela* Small (1911) in the *Simaroubaceae*.

CASTELIA CUNEATO-OVATA Cav., Anal. Cienc. Nat. Madrid. 3: 134—135, pl. 30, and Icon. & Descr. Pl. 6: 60, pl. 583. 1801.

Synonymy: *Priva laevis* A. L. Juss., Ann. Mus. Hist. Nat. Paris 7: 70. 1806. *Verbena tuberosa* R. Graham, Edinb. N. Phil. Journ. 29: 174. 1840. *Priva ? orchioides* Walp., Repert. 4: 36. 1845. *Verbena orchioides* Walp., Repert. 4: 36, in syn. 1845. *Verbena lobelioides* Hort. ex Schau. in A. DC., Prodr. 11: 533. 1847. *Bouchea copiapensis* C. Gay, Hist. Fis. Chile Bot. 5: 26 and Atlas 1: pl. 55. 1849. *Cartelia cuneato-ovata* Cav. apud C. Gay, Hist. Fis. Chile Bot. 5: 7. 1849. *Pitraea chilensis* Turcz., Bull. Soc. Imp. Nat. Mosc. 35 (2): 329. 1862. *Bouchea copiapina* Gay ex R. A. Phil., Anal. Univ. Chil. 35: 193. 1870. *Phelloderma cuneato-ovata* (Cav.) Miers, Trans. Linn. Soc. Lond. Bot. 27: 100. 1870. *Castilleja cuneato ovata* Cav. apud F. Philippi, Cat. Pl. Vasc. Chil. 217. 1881. *Priva orchidoides* Walp. ex Jacks., Ind. Kew. 2: 628, in syn. 1894. *Priva cuneato-ovata* (Cav.) Rusby, Bull. Torrey Bot. Club 27: 80. 1900. *Priva cuneato-ovatis* (Cav.) Rusby apud Grenz., Ann. Mo. Bot. Gard. 13: 74. 1926. *Bouchea copiapensis* Clos.-Phil. ex Moldenke, Prelim. Alph. List Invalid Names 7, in syn. 1940.

Literature: See the list given under the genus as a whole.

Illustrations: Cav., Anal. Cienc. Nat. Madrid 3: pl. 30. 1801; Cav., Icon. & Descr. Pl. 6: pl. 583. 1801; C. Gay, Hist. Fis. Chile Bot. Atlas 1: pl. 55. 1849; Miers, Trans. Linn. Soc. Lond. Bot. 27: pl. 27. 1870; Gartenfl. 32: pl. 1131 (colored). 1883; Sanzin, An. Soc. Cienc. Argent. Buenos Aires 88: 106. 1919; Kobuski, Ann. Mo. Bot. Gard. 13: pl. 4, fig. 12, & pl. 5, fig. 21.

1926; Junell, Symb. Bot. Upsal. 4: figs. 73, 74, & 77—79. 1934.

Perennial herb, to 6 dm. tall, usually 3—5 dm. tall, erect, glabrous and glaucescent or more or less puberulent, ablt to withstand great drought, often more or less stoloniferous, with a somewhat flexuous taproot about 7.5 cm. long and a few other long fibrous roots which bear deep in the ground one or more very small globose or elliptic edible tubers; tubers produced at the ends of the fibrous roots, about the size of a hazelnut (Corylus avellana L.) or small potato (Solanum tuberosum L.); stems erect, often rather stiffly so, fistulose, simple or few-branched from the base, more or less fleshy, stiffly pilosulous or very lightly puberulent above, often glabrous and glaucescent toward the base, green when fresh, light-brownish or stramineous in drying, rather obtusely tetragonal or acutely so at the base, often leafy to the base with the leaves about 5 cm. apart; branches few, opposite, arising from the base or up to a height of 22 cm., tetragonal; nodes more or less annulate; principal internodes 1—7.3 cm. long; leaves decussate-opposite, often with several or many small ones fascicled on very much abbreviated branchlets in their axils; petioles slender or stout and fleshy, 0.5—3 cm. long, flattened in drying, very obscurely and minutely puberulous or glabrate, sometimes with the margins lightly ciliate; leaf-blades varying from ovate to deltoid-ovate or oblong-ovate, rather fleshy when fresh, membranous or chartaceous in drying, uniformly pale-green on both surfaces or paler beneath, 1.2—7.5 cm. long, 1—5 cm. wide, abruptly obtuse or acute at the apex, coarsely and irregularly dentate or deeply serrate along the margins with sharp-pointed often widely divergent and mucronate teeth, very abruptly narrowed to an acute or acuminate, often truncate-cuneate, base and narrowed into the petiole, minutely pulverulent-puberulent or even rugulose on both surfaces, becoming subglabrate with only the teeth scabrous-ciliate; midrib and the 5—7 pairs of ascending and rather straight secondaries slender, obscure above, not at all prominulent beneath when dry; vein and veinlet reticulation not discernible; inflorescence terminal, spicate, 6—28 cm. long, 1.5—5 cm. wide, many-flowered, very shortly pilosulous, sometimes appearing pseudo-capitate when young, with loose terminal heads to 5 cm. wide, the flowers eventually scattered or disposed in approximate whorls of 2—6 or more; peduncle continuous with the stem or branch and similar in all respects, 2—5.5 cm. long, puberulent; rachis similar to the peduncle in texture and pubescence; bracts and bractlets none, but the prophylla conspicuous, one subtending each flower, elliptic-oblong, sessile, acute or acuminate at the apex, 4—8 mm. long, 2—2.5 mm. wide, puberulent, from half as long as to equaling the calyx in length; flowers sessile or subsessile or on obscure pedicels to 1 mm. long, about 9.5 mm. wide, attractive, very sweet-scented; calyx green with red-purple stripes, tubular, thin-textured (almost translucent), 6.5—10 mm. long, zygomorphic, somewhat curvate, 5-costate and fluted, finely puberulent, 2-lipped, the lower (abaxial) lip longer and 2-lobed, with the lobes about 4.1 mm. long, the upper (axial) lip shorter and 3-lobed, with the lobes 1.5--2 mm. long, all 5 lobes narrow-ovate and long-acuminate; corolla hypocrateriform, zygomorphic, varying from white, whitish-lilac, purplish-white, pinkish-white or grayish-white to purple, violet, lilac, blue, rose, lilac-rose, lilac-red, pink, very pale-mauve, pale-rose, or parme-violet mauve, sometimes white tinged with light-purple or whitish outside and pink inside, its tube broadly cylindric, curvate, about 11 mm. long on the upper and 14 mm. long on the lower side, light-textured, glabrous, about 2 mm. in diameter, slightly ampliate beneath the limb, the limb 2-lipped, 5-lobed, the upper lip 2-lobed, with each lobe obovate-elliptic, about 5.2 mm. long and 4.5 mm. wide, blunt at the apex, the lower lip 3-lobed, the central lobe largest, elliptic, about 10 mm. long and 8 mm. wide, blunt at the apex, the two lateral lobes medium-sized, broadly elliptic, about 8 mm. long and 7 mm. wide, blunt or rounded at the apex; fertile stamens 4, didynamous, included, the upper pair inserted about 1.3 mm. below the lower corolla-limb sinus and 4.1 mm. below the upper sinus, the lower pair inserted about 5.1 mm. below the lower sinus and 7 mm. below the upper sinus, the upper pair being on the lower (larger) lip; filaments filiform, the lower pair about 1.4 mm. long, the upper pair about 2.6 mm. long, all four often more or less genuiflexuous and more or less pilose; anthers oblong or ovate, about 2 mm. long and 1 mm. wide, deeply cordate or sagittate to the middle from the base when ripe through the spreading of the thecae, opening by longitudinal slits; staminode one, anantherous, shorter than and inserted somewhat lower than the lower pair of fertile stamens; pistil included, rarely 3-carpellary; style rather stout, about 7.8 mm. long, glabrous, about equaling the corolla-tube, filiform but gradually dilated and compressed toward the apex; stigma rather large, capitate, uncinate-recurved, mucronate, bilamellately compressed, unlobed, papillose on the inner surface; ovary varying from subcylindric or oblong to oblong-conic, situated on a glandular disk, about 3.1 mm. long and 1.4 mm. wide, glabrous, 2--4-celled, with the dissepiment directed toward the axis of the inflorescence and 2-lamellate, the lamellae distinctly separated; ovules usually 4, erect; fruiting-calyx distended, bottle-shaped, closely investing and including the fruit, about 9 mm. long and 4 mm. wide, minutely puberulent, contracted and pressed together above the fruit, the rim 5-caudate, the teeth contorted-plicate; fruit rarely produced, green and light-yellow, drupaceous, included by the mature fruiting-calyx, ovate or ovate-acute, about the size of a grain of pepper (Piper nigrum L.), apiculate, smooth, scarcely striate, indehiscent, 2-celled, the cells covered by a dorsal thick and somewhat corky mesocarp, surrounded along the margins, at the cuneate-acuminate apex, and at the hollow base by a thick pith, at maturity forming two pyrenes or nutlets, immersed in and about half as long as the cells, ovate, convex on the back and flat on the sides, deeply 9-sulcate on the outside, with the channels filled by mesocarp, 2-sulcate within, osseous, each 2-locular, the locelli perforated at the base by the nutritive vessels, the columella central, thin-membranous, empty, adnate, forming a vacant space between the nutlets; seeds solitary in each locellus, oblong, subterete, erect, attached at the extero-basal angle by a short funiculus; integument very thin; raphe lateral, ascending to the apical chalaza; embryo included in a sparse albumen, linear-cylindric; cotyledons 2, twice as long as the inferior radicle.

The species is based on a collection made by Louis Née in the year 1794 on the pampas of Argentina. According to collectors, it inhabits the sandy soil of deserts, red soil, sandy loam, dry open sunny cultivated fields, irrigation ditches and moist places when available, pampas, roadsides, in semi-shade when available, wet matorrales, dry streambeds, pastures, the edges of canyons, margins of lakes, the base of hills, cultivated ground and rocky places in general. It is said to be a weed in gardens, in cities, and in cultivated ground in general, usually in rather dry although somewhat shaded situations; in moist ground it becomes leafy. Schulz found it abundant in brambly ground along railroad tracks in Tucumán; Jörgensen found it abundant in potreros in Catamarca and common in meadows in the Chaco. Venturi found it growing among rocks in quebrados. Werdermann reports it to be "a widespread weed" in Chile, but Hosseus and Lossen found it only "here and there" in Argentina. It ascends from near sealevel to 3420 meters altitude in Argentina. It has been collected in anthesis in every month of the year except July.

Of all the material examined by me, only one sheet has been in fruit; this was collected by Gillies and is deposited in the Kew herbarium. It has only 6 or 8 fruits scattered here and there in the spikes. It would seem, therefore, that fruit is seldom produced by this species. The flowers are strongly odorous and fragrant. There is a decided taproot, with only very few small side-roots. The morphology of the species is discussed by Dahlgren in Svensk. Bot. Tidsk. 32: 231 (1938) and the gynoecium morphology by Junell in Symb. Bot. Upsal. 4: 39--43 & 77--79 (1934). When the leaves are large, as on the Hort. Erf. specimen from Peru in the Berlin herbarium, they remind one of the leaves of *Chenopodium album* L. or of *Spinacia oleracea* L. Good examples of the tubers can be seen on *Rusby 2531* in the Columbia University herbarium, *Schickendantz 72* at Berlin, *Lorentz 62* and *140* at Berlin, *Hort. Berol. s.n.* [März '76] at Berlin, *Philippi s.n.* at Berlin and Vienna, *Stuckert 5498* at Geneva, and *Venturi 590* and *790* at Washington. The Meyen specimen at Berlin shows the whorled character of the flowers very well, as do also the Hort. Erf. specimen from Peru at Berlin, *Herb. Bernhardi s.n.* at Berlin, *Stuckert 18639* at Geneva, *Werdermann 137* at the Gray Herbarium, and *Venturi 4865* at the Gray Herbarium. Many scores of sheets show the flowers in approximate whorls, the uppermost often too crowded to show it clearly.

Common names recorded for the species are "bapilla", "cuchipapa", "papa de zorra", "papilla" [=small potato], and "vara de San José". Metcalf calls the plant and "annual herb", but this is certainly an error in observation. The species resembles in some respects Priva grandiflora (Ort.) Moldenke from similar habitats in Mexico, which also produces small underground tubers. It has been confused by herbarium workers with Bouchea pseudogervao (St. Hil.) Cham.

I am assuming that the specimens collected in the state of Rio de Janeiro, Brazil, were from introduced and naturalized material, perhaps growing as a weed in the city of Rio de Janeiro itself. Maldonado B.177 has labels which state that the plant occurs on streets and in cultivation in Santiago del Estero, Argentina.

Pitraea chilensis is often erroneously cited to volume 36, part 2, page 328, of Bull. Soc. Imp. Nat. Mosc., but was actually published in volume 35, part 2, page 329. It is based on Bridges 1354 from Coquimbo, Chile. The name Priva orchioides is based on the Hort. Berol. s.n. collection, gathered from cultivated material in the Botanischer Garten at Berlin in August, 1843, and deposited in the Berlin herbarium. The original date of its publication is usually given as 1844 or 1845, but according to a writer in Flora on April 7, 1846, page 207, the first twelve sheets of this volume of Walpers' Repertorium, including the page with the original description of this plant, were just then published.

In all, 315 herbarium specimens and 33 mounted photographs have been examined.

Citations: PERU: Ica: Scolnik 1032 (N). Tacna: Raimondi 1813 (B). BRAZIL: Rio de Janeiro: Barboza s.n. [Rio de Janeiro] (Br, Br, Br); Schüch s.n. [Rio de Janeiro] (Mu—242). BOLIVIA: Potosí: Cardenas 3712 (S); Fiebrig 2950 (B). Province undetermined: Bridges s.n. [Bolivia] (V). CHILE: Antofagasta: Pfister 9360 (S). Atacama: Gigoux s.n. [Nov. 1885] (G); I. M. Johnston 5847 (G, N—photo, Z—photo); Meyen s.n. [Copiapo] (B, B, B, K, N—photo, Z—photo); R. A. Philippi 787 (B, N—photo, W—photo, Z—photo), s.n. [Atacama] (V); Werdermann 137 (B, Bm, Ca—238262, Cb, D—549261, E—910057, Ed, G, Gg—34511, K, N—photo, Ut, Z—photo). Coquimbo: Bridges 1354 (Bm, Cb, K, N—photo, Z—photo), 1355 (G), s.n. [prov. Coquimbo] (Br); Cuming 1354 (V); R. A. Philippi 933 (L, X), s.n. [Cuncumen] (B, V, V). Santiago: J. Ball s.n. [Santiago] (K); Claude-Joseph 735 (W—1058708), 804 (W—1058766); Collector undesignated s.n. (Vu); Pahlman s.n. [Los Nogales, 23.1.1913] (S); Tweedie 1105 (K). Tacna: Berninger 309 (B); Buchtien 4381 (W—1175992); Eyerdam 24646 (Ca—657173); Jaffuel 1634 (G); R. D. Metcalf 30350 (W—1834983); H. H. Rusby 2531 (C, F—164663, Pa); Mrs. R. S. Shepard 269 (G, Gg—31231, N, N—photo, P, W—1197324, Z—photo); Skottsberg & Skottsberg 1489 (Go, N, S); Woitschach 87 (B). Tarapaca: D'Urville s.n. (V). Valparaiso: Bridges 453 (K). State undetermined: Claude-Joseph s.n. [Mittleres Chile] (B); Collector undesignated s.n. [Chili] (B, N—photo, Z—photo); C. Gay s.n. (P, P); Reed s.n. (K). ARGENTINA: Buenos Aires: Hauthal 6 (B); Née s.n. [Buenos Ayres]

(F—844436). Catamarca: Brizuela 540 (N), 542 (N), 992 (N, S); Cabrera 1064 (N); Castillón 1942 [Herb. Inst. Miguel Lillo 14243] (N), s.n. [Herb. Inst. Miguel Lillo 14242] (N); Collector undesignated 10 (D); Jörgensen 1022 [Herb. Osten 11426] (Ca—202595, E—809178, G, Ug, W—704749), s.n. [Herb. Mus. Argent. Cienc. Nat. 23989] (N); Schickendantz 72 (B, Cb, Cb); Schreiter s.n. [XI. 1915] (N); Venturi 6079 (W—1591484), 7101 (Gg—160658); Villafane 1166 (N), 1222 (N), 1228 (N), 1244 (N), 1276 (N). Chaco: Jörgensen 2480 [Herb. Osten 13677; Herb. Mus. Argent. Cienc. Nat. 23977] (E—831938, G, N, N, Ug, W—1055186). Córdoba: A. Burkart 10406 (N, N); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 11673] (N), s.n. [Herb. Mus. Argent. Cienc. Nat. 31204] (N); Fielding s.n. (Bm); Galander s.n. [18.II.1881] (B, B, N, N—photo, W—photo, Z—photo); Goodspeed 23241 (Ca—657351); J. Gutiérrez 116 (N); Herb. Baillon s.n. (P); Hieronymus 162 (B, K), 490 (P), s.n. [XI.1874] (B), s.n. [X.1877] (Bm, K), s.n. [X.1879] (Br); Kuntze s.n. [XI.92] (F—297338, N), s.n. [XII.1891] (N); Lorentz 62 (B, B, Bm, Br, Cb, L, Mu—1590, V, X), 140 (B, Ed), 146 (B), 561 (B, N—photo, Z—photo); Lossen 3 (Ba, D—671540, E—919632, F—584611, G, L, Mu—4364); Miers s.n. [Tres Cruces] (Bm); Pierotti 5117 (N); Rodrigo 389 (N, N); Scolnik 1756 (S); Stuckert 125 (Cb), 561 (Cb), 776 (Cb), 932 (Cb), 1642 (Cb), 2515 (Cb), 3550 (Cb), 3631 (Cb), 5179 (Cb), 5498 (Cb), 5679 (Cb), 5938 (Cb), 7092 (Cb), 7296 (Cb), 8431 (Cb), 8517 (Cb), 9201 (Cb), 11293a (Cb), 17304 (Cb), 21569 (Cb); Troncoso 317 (N); Tweedie s.n. (K); Villafane 92 (N); Wall & Sparre s.n. [17/12/46] (Ew, Ew, Ew, Ew). Jujuy: Balls 5932 (W—1777767); Claren 11738 (S); Lillo s.n. [Herb. Inst. Miguel Lillo 9651] (N); M. Meyer s.n. [Herb. Inst. Miguel Lillo 34399] (N); Venturi 4865 [Herb. Osten 20788] (F—637873, G, N, Ug, W—1591446), 8594 (E—962143, G, W—1591410). La Rioja: Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 33900] (N); Esteban 28 [Herb. Lab. Bot. Buenos Aires 10676; Herb. Osten 19357] (Ug); Hieronymus & Niederlein 522 (B); Hosseus 1487 (B); Schmaedke s.n. [Stuckert 18639] (Cb); Stuckert 18964 (Cb); Venturi 7848 (G, N—photo, Ug, W—1442917, W—1591394, Z—photo). Mendoza: Collector undesignated s.n. (V); G. Dawson 954 (N); Gillies s.n. (Ed, K, N—photo, Z—photo); Jensen-Harup s.n. [Santa Rosa, 1905] (Cp, Le, N—photo, Us, Z—photo); Jörgensen 97 (Cp); D. O. King 142 (Bm); Lourteig 937 [Herb. Inst. Miguel Lillo 114104] (S); Miers s.n. [Mendoza] (Bm), s.n. [Travesia de Mendoza] (Bm, N); Paci 646 (N, Ug); R. A. Philippi s.n. [Mendoza] (B, B); Ruíz s.n. [Herb. Mus. Argent. Cienc. Nat. 25/2183] (N), s.n. [Herb. Mus. Argent. Cienc. Nat. 25/2215] (N); Ruiz Leal 8905 (N), 9024 (N), 10762 (Z); Sandeman 4712 (K); Semper s.n. [29.II—6.

III.1944] (N, Si); Villafane 899 (N), 933 (N), 974 (N), 990 (N), 1025 (N), 1073 (N, S). Salta: Hunziker 1312 (N, N); Lillo s.n. [Herb. Inst. Miguel Lillo 8082] (N), s.n. [Herb. Inst. Miguel Lillo 32457] (N, N); T. Meyer 3883 [Herb. Inst. Miguel Lillo 35686] (En, N), 4771 (Ca—905960, N, N); D. Rodriguez 1253 [Herb. Inst. Miguel Lillo 16667] (F—809356, N), s.n. [Herb. Mus. Argent. Cienc. Nat. 23978] (N). San Juan: Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 26/598] (N); Cuezzo 1033 (N), 1417 (N, S), 1585 (N), 1839 (N), 1876 (N), 1980 (N); Jameson s.n. [San Juan & Jachal, 9/71] (K, K, N—photo, Z—photo). San Luís: Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 25/931] (N), s.n. [Herb. Mus. Argent. Cienc. Nat. 25/2923] (N), s.n. [Herb. Mus. Argent. Cienc. Nat. 26/2269] (N), s.n. [Herb. Mus. Argent. Cienc. Nat. 26/2277] (N); Terribile 752 (N). Santa Fé: Ragonese s.n. [Herb. Mus. Argent. Cienc. Nat. 19771] (N). Santiago del Estero: Balegno 231 (N, S); Cuezzo 2337 (N); Herb. Inst. Miguel Lillo 9 (S); Lillo s.n. [Herb. Inst. Miguel Lillo 6133] (N); Luna Risso 58 (N); Maldonado B.177 (Ca—882449, N), 326 (N); Monetti 428 (N); Venturi 5759 (N, W—1591480). Tucumán: Bailetti 308 (N); Dinelli s.n. [Herb. Inst. Miguel Lillo 11870] (N); Herrera 284 (S); Lillo s.n. [Herb. Inst. Miguel Lillo 323] (N); Monetti 811 [Herb. Inst. Miguel Lillo 15280] (N), s.n. [Herb. Inst. Miguel Lillo 32466] (N); Peirano s.n. [Herb. Inst. Miguel Lillo 78631] (N); Schreiter s.n. [Herb. Osten 12189; Herb. Inst. Miguel Lillo 32600; Herb. Mus. Hist. Nat. Montev. 4929] (N, Ug, Ug); A. G. Schulz 2890 (N); Stuckert 9089 (Cb); Venturi 590 (N, W—1591225), 790 (N, W—1591228), 2179 (N). Province undetermined: Collector undesignated s.n. (B); Hosseus 1021 (B); Jameson s.n. [Herb. Hance 19693] (Bm, Us), s.n. [9/72] (K), s.n. [1871—72] (B, V). CULTIVATED: Argentina: Maldonado B.177 (N). Belgium: Hort. Thenensis II.804 (Br). England: Herb. W. Hooker s.n. [Hort. Kew] (K); Herb. Soc. Hort. London s.n. [1840] (K); Reid s.n. [Yalding, Kent, 21/8/15] (K). Germany: Herb. K. Koch s.n. (B); Herb. Kummer s.n. (Mu—1237); Hort. Berol. s.n. [Aug. 1841] (B), s.n. [Aug. 1843] (B, N—photo, Z—photo), s.n. [Maerz '76] (B), s.n. [27.9.1879] (B), s.n. (B); Hort. Erf. s.n. ["Peru"] (B, B, N—photo, Z—photo). Sweden: Hort. Mus. Bot. Stockholm s.n. [1855] (S). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated s.n. ["F"] (G); E. W. White 56 (Bm).

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS *CITHAREXYLUM*. I

Harold N. Moldenke

This is the nineteenth in my series of works of monographic nature on the genera of *Verbenaceae*. Previous genera so treated are *Aegiphila* Jacq., *Amasonia* L. f., *Baillonia* Bocq., *Bouchea* Cham., *Casselia* Nees & Mart. [*Timotocia* Moldenke], *Castelia* Cav., *Chascanum* E. Mey., *Cornutia* Plum., *Petitia* Jacq., *Petrea* Houst., *Priva* Adans., *Recordia* Moldenke, *Rehdera* Moldenke, *Rhaphithamnus* Miers, *Svensonia* Moldenke, *Tectona* L. f., *Vitex* Tourn., and the New World and cultivated members of *Callicarpa* L.

Full explanation of the abbreviations employed herein for the names of the 249 herbaria whose material was examined in the preparation of this work will be found in Phytologia 5: 154—159 (1955) with the following additions:

Ad = Universidad de Los Andes, Mérida, Venezuela
Fy = University of Arkansas, Fayetteville, Arkansas
Lz = A. Lutz Herbarium, Universidade do Brasil, Rio de Janeiro
Pe = Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru
Sk = University of Saskatchewan, Saskatoon, Saskatchewan
Yu = T. G. Yuncker Herbarium, Greencastle, Indiana

CITHAREXYLUM B. Juss. ex L., Sp. Pl., ed. 1, 625 (1753), Gen. Pl., ed. 5, 273 [as "*Citharexylon*"]. 1754.

Synonymy: *Citarexylon* L., Syst. Nat., ed. 6, ind. p. 2. 1748. *Citharexylon* L., Syst. Nat., ed. 6, 116. 1748. *Citharexylon* B. Juss. ex L., Amoen. Acad. 1: 406. 1749. *Citharexylum* Mill., Gard. Dict., ed. 6, App. 1752. *Citharoxylon* L., Syst. Nat., ed. 11, 2: ind. q.3. 1760. *Citharexylon* Pluk. ex Adans., Fam. Pl. 2: 200. 1761. *Kitarexulon* Adans., Fam. Pl. 2: 12. 1763. *Citharoxylum* Mill. ex Hildt, Beschr. In- und Ausl. Holzart. 45. 1798. *Rauwolfia* Ruíz & Pav., Fl. Peruv. & Chil. 2: 26, pl. 152. 1799 [not *Rauvolfia* Plum., 1737 & 1753]. *Citharexylon* L. ex Steud., Nom. Bot., ed. 1, 202. 1821. *Scleroon* Benth. ex Lindl., Bot. Reg. 29: Misc. 65. 1843. *Citharexylum* L. ex Walp., Repert. 6: 690. 1847. *Cytharexylon* L. ex C. Gay, Hist. Fis. Chile Bot. 5: 33—34. 1849. *Cytharexylum* Mill. ex Sessé & Moc., La Naturaleza, ser. 2, 1: 103. 1889. *Cacocalyx* S. Wats., Proc. Amer. Acad. 24: 67, hyponym. 1889. *Cithavexylon* Britton, N. Amer. Trees 825, sphalm. 1908. *Cytharexylon* Mill. ex Le Cointe, Amaz. Brasil. III Arv. & Pl. Uteis 349. 1934. *Cisharescylum* Mill. ex Moldenke, Prelim. Alph. List Invalid Names 15, in syn. 1940. *Citharexylon* Mill. ex Moldenke, Prelim. Alph. List Invalid Names 15, in syn. 1940. *Cytarexilum* Mill. ex Moldenke, Prelim. Alph. List Invalid Names 24, in syn. 1940. *Cytarexylon* Mill. ex Moldenke, Prelim.

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Trees or shrubs, rarely climbing; branches and branchlets usually tetragonal, sometimes spiny; leaf-scars mostly large, corky, and elevated, borne on more or less prominent sterigmata; leaves decussate-opposite or verticillate, rarely approximate, subopposite, or even alternate, deciduous, exstipulate, petiolate or sessile, entire or dentate, usually bearing a pair of prominent glands at the base of the blade; petioles rarely myrmecophilous at the apex; inflorescence indeterminate, racemiform or spicate, axillary and terminal, mostly elongate and many-flowered, rarely reduced to only a few flowers, erect or nutant, mostly simple, occasionally sparsely branched; flowers small, each subtended by a tiny inconspicuous bractlet; calyx tubular or cyathiform, regular or somewhat zygomorphic, thin, accrescent, its rim truncate and entire to 5-toothed or -lobed; corolla infundibular or hypocrateriform, mostly yellow or white, varying to blue, violet, or lilac, its tube narrow-cylindric and regular, its limb spreading, usually 5-parted, rarely 4- or 6-parted, with broad slightly irregular lobes, the 2 hindermost outermost in prefloration, mostly more or less pubescent in the throat; stamens 4, didynamous, inserted at or above the middle of the corolla-tube, included, a fifth stamen represented by a very rudimentary staminode, or occasionally stamens 5 or even 6; filaments very short; anthers ovate or sagittate, introrse, erect, with 2 parallel thecae opening by longitudinal slits and a thickened connective which often surpasses the thecae in length; style terminal, included, often thickened toward the apex; stigma very shortly bifid; ovary perfectly or imperfectly 4-celled, composed of 2 carpels, each cell containing one lateral anatropous ovule; fruiting-calyx conspicuously enlarged and indurated, cupuliform or patelliform, shorter than the fruit; fruit drupaceous, with a juicy exocarp and a hard endocarp, with two 2-celled and 2-seeded pyrenes, which are often separated by a median fissure.

The genus contains about 130 valid species, varieties, and natural hybrids, ranging from Bermuda, Florida, and Texas through Mexico, Central America, and the West Indies to central Argentina and Uruguay. Several fossil forms are known from the Tertiary formations of the United States, Colombia, and Italy. The type species is C. spinosum L. Thirty-one species and varieties are or have been cultivated in various parts of the Old and New Worlds, the most common being C. spinosum, cultivated on every continent of the world and on many islands of the sea.

In Bentham's time (1876) only about twenty species were known in the genus, and Briquet, writing in 1894, also recognized only a similar number. Even Skottsberg, writing in 1956, calls it a neotropical genus of about 20 species. The generic name is derived from the Greek "kithara", a lyre, and "xulon", wood. The genus is a member of Tribe 6, Citharexyleae Briq., in Subfamily 1, Verbenoideae Briq. -- the only subfamily, according to Junell, which deserves to remain in the family Verbenaceae. Yet the genus was placed in the family Labiatae [=Lamiaceae], section Verbeneae, by Reichenbach in Mössler, Handb. Gewächsk., ed. 1, 1:xxxvi (1827) and ed. 3, 1:lxxv (1833) and in his Conspect. Reg. Veg. 1: 117 (1828).

The scientific name of the genus has been variously spelled by authors and by herbarium workers; sometimes in several ways in the same publication -- e.g., Adanson in his Fam. Pl. (1763) spells it "Kitarexulon" on page 12 and "Citharexylon" on page 200, and Lombardo in his Invent. Pl. Cult. Montevid. (1941) spells it "Citharexylum" on pages 67 and 266 and "Citharexylon" on page 248. The name is said to have been proposed first by Philip Miller in his Gard. Dict., ed. 6, page 175 (1752), and is accredited to him by Jackson in the Index Kewensis. This, however, is a pre-linnean work and does not enter into nomenclatural priority under the present edition of the International Rule of Nomenclature. I am following Bentham, Briquet, Schulz, and Greenman in adopting the strict Latin form of the name, as was done also by Linnaeus in the first edition of his Species Plantarum (where he does not accredit the name to anyone) in 1753, notwithstanding the fact that Linnaeus used the Greek termination in his Genera Plantarum in 1754 and in his Dissertation defended by C. M. Dassow as far back as 1747, where he accredits the name to Bernard de Jussieu. Greenman correctly points out that the pre-linnean spelling of the name was always in the Greek form except when used by Miller.

Many popular and vernacular names have been recorded for the genus as a whole. Antoine Laurent de Jussieu, in his Gen. Pl. 119--123 (1789), proposed the French names "bois de guittare" and "guittarin"; Necker, in Elem. Bot. 1: 362--389 (1790), proposed "citharexylone"; Willdenow in 1797 proposed the German name "Geigenholz"; Mirbel in Hist. Nat. Pl., ed. 3, 15: 221 (1805) calls the members of the genus "cotelets", while Poiret in Lam., Encycl. Méth. Bot. Suppl. 2: 279 & 367 (1811) uses the singular form "cotelet" for them. The same author, in Dict. Sci. Nat. 9: 284 (1817) uses the names "bois de guitare", "cotelet", and "guitardin". Gay, in his Hist. Fis. Chile Bot. 5: 33 (1849), proposes the Spanish name "citarexilon". Gerth van Wijk in 1911 added the names "bois à côtelettes", "bois cotelet", "bois de guitard", "bois fidèle", "bois guitarin", "fiddle wood", "fiddle wood tree", "Geigenholzbaum", "guitar wood", "Leierholz", "susanna", and "vedelhoutboom". The Harrars, in their Guide to Southern Trees 648 (1946) record the name "nightshades". Sessé & Mociño, in their Fl. Mex., ed. 1, 166 (1895), say "Vulgo Chachalaca quia illume expetunt huiius nominis Phasiani". They also state that the flowers vary to violet in color. Moldenke, in Phytologia 2: 95 (1944) adds "fiddle-wood", "fiddlewood", "fiddlewood tree", "fidelle-wood", "fiolintraee", "fioltraed", "gigatraed", "gigetraee", "le bois cotelet", "le bois de guitard", "le cotelet", "vedel houthboom", and "zither-wood".

Quite a few authors state that the group is called "fiddlewood" because the wood is employed to make fiddles, violins, or other musical instruments. Jussieu and Linnaeus apparently believed this to be true when they adopted the name *Citharexylum* for it. The true situation, however, seems to be that the early French explorers in the West Indies referred to the native species there as "bois fidèle", signifying a faithful, true, or trustworthy tree, because of the use of its wood in home construction. The English later corrupted this to "fidelle-wood" and then "fiddle-wood", and, on the basis of this name, Jussieu and Linnaeus made up the scientific generic name from the Greek equivalents. Actually, the wood is not used in the manufacture of fiddles or any other musical instruments anywhere.

The wood anatomy and common names for the genus are discussed by Record & Mell in their Timbers of Tropical America, 523--528 (1924). Junell, in Symb. Bot. Upsal. 4: 46--48 (1934) discusses the gynoecium morphology. Bentham points out in Benth. & Hook. f., Gen. Pl. 2 (2): 1149 (1876) that Ruíz & Pavon's *Rauwolfia*, consisting of *Citharexylum flexuosum* (Ruíz & Pav.) D. Don and *C. montevidense* (Spreng.) Moldenke, is a small group in the genus which resembles *Rhaphithamnus* Miers in habit. I assume that he makes this statement because of the spinose stems and branches of these two species -- and of several more recently described species from western South America. The resemblance, however, is very superficial.

Poiret points out in Lam., Encycl. Méth. Bot. Suppl. 2: 367 (1811) that the details of the fruit illustrated under letters g to o in Lam., Illustr. pl. 545, fig. 2 (1797) pertain to *C. paniculatum* Gaertn., which is actually not a member of this genus at all, but is *Petitia domingensis* Jacq. The same statement applies equally well to the illustration in Gaertn., Fruct. & Sem. 1: pl. 56 (1788).

In the Linnean Herbarium in London the brown cover which includes the genus cover is labeled "Cytharexylon", but Linnaeus' actual genus cover within it has the name spelled "Citharexylon". It is genus number 777. Specimen number "1" in this cover is unnamed, but a later hand has added "Morus tinctoria G." [=Gray]. Specimen number "2" is labeled "cinereum" in Linnaeus' handwriting; a later note added by Smith says "Nova planta....Plantae surin. non Syst."; it is actually a species of Schlegelia in the Bignoniaceae. Specimen number "3" is unnamed and is also a specie of Schlegelia. Specimen number "4" is unnamed and bears the notation in Linnaeus' handwriting "Ko. 89" [=König]; it is also a species of Schlegelia. Specimen number "5" is labeled "caudatum" in Linnaeus' handwriting, and certainly is what we know as Citharexylum caudatum L. today; it bears the notation "Br" [=Browne] in Linnaeus' handwriting. Smith apparently struck out the name "caudatum" in pencil and then later rewrote it. Patrick Browne's herbarium was purchased for Linnaeus in 1758.

The Poeppigia Bert. included in the synonymy of Citharexylum by Jackson and other authors is actually a synonym of the genus Rhaphithamnus. That it is not congeneric with Citharexylum was pointed out already by Meisner in Pl. Vasc. Gen. 2: 199 (1840).

The "Jacq. Ic. Pl. Rar. ed. 1, 4, pl. 82. 1781" cited by O. E. Schulz in Urb., Symb. Ant. 6: 63 (1909) appears to be a preliminary edition of this famous work by Jacquin, distributed by him to a certain select few of his friends. The botanical garden at Berlin apparently had a copy of this edition in 1909, but it was destroyed in World War II. According to Dr. Humbert, who very kindly looked up the matter for me in Paris, there is still a copy of this edition in the Bibliothèque Nationale in Paris "sur la cote 5.977". Plate 82 in this work is actually a Citharexylum (see under C. fruticosum var. villosum), while that plate in the ordinary edition is a Dianthus species.

The "Citharexylum sp. (det. Moldenke)" of Svenson, Am. Journ. Bot. 33: 480 (1946) is actually C. svensonii Moldenke and the specimen which he cites is the type collection, as was originally reported by me to the collector when he was preparing this report. The "Citharexylum sp." of Stellfeld, Trib. Farmac. 19 (10): 164 (1951) is C. myrianthum Cham. The "Cytharexylon" referred to by Le Cointe in his O Estado do Para, p. 239 (1945) under the name of "pau de viola", whose wood is used for domestic, civil, and industrial construction, may also be C. myrianthum, since this is the species to which the name "pau de viola" is commonly applied in other parts of Brazil. If so, the wood is probably imported into Pará, because the species is known to grow wild in Brazil only from Pernambuco south to Rio Grande do Sul.

The Little 8199 distributed as Citharexylum sp. is not verbenaceous; it is probably a member of the *Rubiaceae*. Similarly, *Edw. Palmer 423*, also distributed to herbaria as a species of *Citharexylum*, is *Bunchosia biocellata* Schlecht. in the *Malpighiaceae*, while *Spruce 6223* is a species of *Schlegelia*, The *Ehrenberg s.n.* from "S. Domingo", determined originally as *Myginda microphylla* DC. and re-determined as possibly a *Citharexylum* species by Britton, is actually *Rhacoma gonoclada* Urb. in the *Celastraceae*.

On the other hand, specimens that are actually *Citharexylum* have been misidentified in herbaria as *Sideroxylon* spp. in the *Sapotaceae* and as *Basistemon brasiliensis* Moldenke in the *Scrophulariaceae*.

Species excluded from the genus are the following:

Citarexylon ? *mendocinum* R. A. Phl. = *Grabowskia* sp., *Solanaceae*

Citharexyllum cyanocarpum Hook. = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke

Citharexylon calycinum Sx. = *Seguiera floribunda* Benth., *Phytollaccaceae*

Citharexylon caudatum Hort. = *Buddleia melliodora* Kunth & Bouché, *Loganiaceae*

Citharexylon cyanocarpa Hook. & Arn. = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke

Citharexylon cyanocarpon Hook. & Arn. = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke

Citharexylon cyanocarpum C. Gay = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke

Citharexylon cyanocarpum Hook. = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke

Citharexylon cyanocarpum Hook. & Arn. = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke

Citharexylon cyanocarpum Schlecht. & Cham. = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke

Citharexylon dentatum Lodd. = ? [said to be from "Ind. or."]

Citharexylon elegans Phil. = *Rhaphithamnus venustus* (R. A. Phil.) B. L. Robinson

Citharexylon germaini Briq. = *Diostea juncea* (Gill. & Hook.) Miers

Citharexylon melanocardium Sw. = *Petitia domingensis* Jacq.

Citharexylon ? *mendocinum* R. A. Phil. = *Grabowskia* sp., *Solanaceae*

Citharexylon mertensianum Rupr. = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke

Citharexylon paniculatum Gaertn. = *Petitia domingensis* Jacq.

Citharexylon ramizii Glaz. = *Schlegelia ramizii* (Glaz.) Sandw., *Bignoniaceae*

Citharexylon sericeum Lodd. = ? [said to be from "Ind. or."]

Citharexylon spicatum Rusby = *Aegiphila spicata* (Rusby) Moldenke

Citharexylon tenuifolium Forst. = *Myoporum tenuifolium* Forst., *Myoporaceae*
Citharexylon venustum R. A. Phil. = *Rhaphithamnus venustus* (R. A. Phil.) B. L. Robinson
Citharexylon verticillatum Don = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke
Citharexylum alpinum Poepp. = *Diostea cinerascens* (Schau.) Moldenke
Citharexylum buxifolium (Willd.) Spreng. = *Clerodendrum buxifolium* (Willd.) Spreng.
Citharexylum caudatum Hort. = *Buddleia melliodora* Kunth & Bouché, *Loganiaceae*
Citharexylum cyanocarpum C. Gay = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke
Citharexylum cyanocarpum Hook. & Arn. = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke
Citharexylum coeruleum Dombey = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke
Citharexylum elegans Phil. = *Rhaphithamnus venustus* (R. A. Phil.) B. L. Robinson
Citharexylum emarginatum Briq. = *Clerodendrum buxifolium* (Willd.) Spreng.
Citharexylum flexuosum var. *subglabrum* Moldenke = *Lycium subglabrum* (Moldenke) Moldenke, *Solanaceae*
Citharexylum germaini Briq. = *Diostea juncea* (Gill. & Hook.) Miers
Citharexylum linearifolium Moldenke = *Baillonia amabilis* Bocq.
Citharexylum macaodripin Standl. = *Rehdera trinervis* (Blake) Moldenke
Citharexylum macrocarpum Standl. = *Rehdera trinervis* (Blake) Moldenke
Citharexylum melanocardium Sw. = *Petitia domingensis* Jacq.
Citharexylum menalocardium Sw. = *Petitia domingensis* Jacq.
Citharexylum mendocinum R. A. Phil. = *Grabowskia* sp., *Solanaceae*
Citharexylum mollicellum Standl. = *Rehdera mollicella* Standl. & Moldenke
Citharexylum nigrum Forst. = *Petitia domingensis* Jacq.
Citharexylum ovalifolium Hornemann = *Laguncularia racemosa* (L.) Gaertn., *Combretaceae*
Citharexylum ovatum Turcz. = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke
Citharexylum paniculatum Gaertn. = *Petitia domingensis* Jacq.
Citharexylum paniculatum Poir. = *Premna obtusifolia* R. Br.
Citharexylum panniculatum Gaertn. f. = *Petitia domingensis* Jacq.
Citharexylum penninervium Standl. = *Rehdera penninervia* Standl. & Moldenke
Citharexylum perforatum Forst. = *Myoporum tenuifolium* Forst., *Myoporaceae*

Citharexylum peruvianum Moldenke = *Aloysia ayacuchensis* Moldenke
Citharexylum pinninervium Standl. = *Rehdera penninervia* Standl. & Moldenke
Citharexylum ramizii Glaz. = *Schlegelia ramizii* (Glaz.) Sandw., *Bignoniaceae*
Citharexylum rugosum Forst. = *Petitia domingensis* Jacq.
Citharexylum scandens Briq. = *Schlegelia scandens* (Briq. & Spruce) Sandw., *Bignoniaceae*
Citharexylum scandens Briq. & Spruce = *Schlegelia scandens* (Briq. & Spruce) Sandw., *Bignoniaceae*
Citharexylum tejucense Briq. = *Brunfelsia ramosissima* Pohl, *Solanaceae*
Citharexylum tenuifolium Forst. = *Myoporum tenuifolium* Forst., *Myoporaceae*
Citharexylum trinerve Blake = *Rehdera trinervis* (Blake) Moldenke
Citharexylum verticillatum Don = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke
Citharexylum verticillatum Klotzsch = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke
Cytharexylon cyanocarpum Hook. & Arn. = *Rhaphithamnus spinosus* (A. L. Juss.) Moldenke

Genera in the above list of excluded species not referred to other families are members of the *Verbenaceae*. The two binomials of Loddiges, *C. dentatum* and *C. sericeum*, are accredited to him by Steudel in Nom. Bot., ed. 2, 1: 375 (1840). They are extremely puzzling names. They have been completely ignored by the authors of the Index Kewensis, and exhaustive search through the publications of Loddiges has failed to reveal any mention of them. If they apply to Asiatic plants, as the expression "Ind. or." appears to indicate, they cannot be members of the genus *Citharexylum* unless they were based on cultivated material. Since Loddiges dealt mostly with cultivated material, this might well be possible. It is to be hoped that more information about these names and the plants for which they were proposed will eventually be forthcoming.

In the preparation of this treatment 6473 herbarium specimens have been examined and annotated and 854 mounted photographs and clippings. Included have been the type collections — and in most cases the actual holotypes — of almost all the names involved. In the case of the fossil species and a very few obscure recent species, the type collections have not as yet been made available to me for examination.

In the next part a key will be given. This is an artificial key to the 130 accepted species, varieties, and hybrids of the genus *Citharexylum* as regarded by me at the present writing. This key is strictly dichotomous. To save space on the pages, however, the lines will not be indented as far to the right of the left-hand margin as they should be. Each line being numbered, it will still be easy to find the appropriate opposite line.

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NOTES ON BROMELIACEAE, X

Lyman B. Smith

MEXICO

TILLANDSIA PUEBLENSIS L. B. Smith var. GLABRIOR L. B. Smith, var. nov.

A var. pueblensis bracteis florigeris mox glabris differt.

Type in the U. S. National Herbarium, No. 2,216,850, collected on perpendicular rocks near Tequisistlan, State of Oaxaca, Mexico, altitude 900-1200 meters, April 1, 1957, by M. B. Foster and O. C. Van Hyning (No. 2937).

TILLANDSIA SOCIALIS L. B. Smith, sp. nov.

T. karwinskyana Schult. in systema Mezii proxima sed lepidibus foliorum adpressis, bracteis florigeris valde lepidotis sepala dissite lepidota superantibus differt.

Densely aggregated in large masses (! Foster & Van Hyning), stemless, flowering 4.5-6 dm. high; leaves rosulate, numerous, 3 dm. long, covered throughout with appressed pale-cinereous scales; sheaths broadly triangular-ovate, slightly darker than the blades, 5 cm. long; blades narrowly triangular, acuminate, 15 mm. wide, involute when dry; scape erect, 4-5 mm. in diameter, glabrous; scape-bracts small but subfoliaceous, exceeding the internodes while still exposing much of the scape; inflorescence laxly bipinnate, few-branched; primary bracts lanceolate, little larger than the floral bracts; branches spreading, 2 dm. long, straight, very slender, laxly few-flowered, their basal half sterile and bracteate; floral bracts erect, lanceolate, 25 mm. long, less than twice the internodes, exceeding the sepals, ecarinate, subchartaceous, nerved, covered with appressed cinereous scales, the apex involute when dry; flowers subsessile; sepals narrowly elliptic, obtuse, 17 mm. long, ecarinate, sparsely lepidote, equally connate for about 3 mm.; petals 30 mm. long, dark purple; stamens exserted. Pl. I, fig. 1: Section of spike x 1; fig. 2: Sepal x 1.

Type in the U. S. National Herbarium, No. 2,216,849, collected on rocks at Bridge of Gravilja, State of Chiapas, Mexico, altitude 1200 meters, April 6, 1957, by M. B. Foster and O. C. Van Hyning (No. 2958).

HONDURAS

TILLANDSIA STEIROPODA L. B. Smith, sp. nov.

A T. incurva Griseb., cujus habitum imitans, vaginis foliorum aterrimis, spicarum basibus sterilibus elongatis bracteis valde reductis praeditis, sepalis posterioribus carinatis differt.

Flowering 30-36 cm. high (! Foster); leaves many in a dense rosette but divergent and not bulbous, 30 cm. long, covered with orbicular appressed scales; sheaths large, distinct, oblong-elliptic, very dark castaneous; blades narrowly triangular, long-acuminate, ca. 1 cm. wide, involute, cinereous-lepidote; scape erect, 2 mm. in diameter when dry; scape-bracts erect, imbricate, oblong-elliptic with long filiform blades, the upper ones wholly cinereous; inflorescence digitate from about 10 spikes; primary bracts ovate with filiform blades, shorter than the sterile bases of the spikes; spikes suberect, 11-12 cm. long, the lower half sterile with numerous reduced subimbricate bracts, the upper half laxly 8-10-flowered; rhachis straight, slender, quadrangular, lepidote; floral bracts lance-oblong, acute, to 17 mm. long, equaling or exceeding the sepals, ecarinate, thin, sulcate, lepidote; flowers divergent, subsessile; sepals lance-oblong, obtuse but the margins inrolled, thin, sparsely lepidote, subequally short-connate, the posterior ones carinate; petals ca. 3 cm. long, purple, naked; stamens exserted. Pl. I, fig. 3: Spike x 1/2; fig. 4: Flower x 1; fig. 5: Posterior sepal x 1.

Type in the U. S. National Herbarium, No. 2,216,844, collected in trees, above Tegucigalpa, Honduras, altitude 1200 meters, March 2, 1958, by M. B. Foster (No. 3027).

ECUADOR

TILLANDSIA AEQUATORIALIS L. B. Smith, sp. nov.

A T. compacta Griseb., cui affinis, scapi bracteis subfoliaceis, inflorescentia breviter ellipsoidea, bracteis primariis ex ovato triangularibus differt.

Flowering plant at least 5 dm. high; leaves undoubtedly rosulate, 5 dm. long, obscurely and subdensely vestite with closely appressed pale brown-centered scales; sheaths elliptic, large but merging and concolorous with the blades, pale brown toward base; blades ligulate, caudate-apiculate, 5 cm. wide; scape erect, 5 mm. in diameter, glabrous; scape-bracts erect, densely imbricate, subfoliaceous with conspicuous blades; inflorescence densely bipinnate, broadly ellipsoid, 10 cm. long; primary bracts ovate, the lower ones triangular-acuminate and equaling or slightly exceeding the axillary spikes, pale-lepidote especially toward apex; spikes sessile, lance-elliptic, acute, strongly complanate, 5 cm. long, 2 cm. wide, densely 8-flowered; floral bracts elliptic, acute, almost exactly equaling the sepals, sharply carinate, coriaceous, even except for faint nerves by apex and margin, nearly or quite glabrous; pedicels stout, obconic, 4 mm. long; sepals narrowly elliptic, obtuse, 20 mm. long, the posterior ones sharply carinate and about 2/3 connate; capsule fusiform, 3 cm. long. Pl. I, fig. 6: Leaf-apex x 1/2; fig. 7: Primary bract and spike x 1/2; fig. 8: Posterior sepals x 1.

Type in the U. S. National Herbarium, No. 1,196,293, collected on tree, between El Tambo and La Toma, Province of Loja, Ecuador, altitude 1000-2200 meters, September 3, 1923, by A. S. Hitchcock (no. 21328). Isotypes in the Gray Herbarium and in the herbarium of the New York Botanical Garden.

TILLANDSIA FLAGELLATA L. B. Smith, sp. nov.

Facie Vriesiam didistichoides (Mez) L. B. Smith simulans sed bracteis florigeris ecarinatis subduplo majoribus differt.

Flowering plant 25-30 cm. high; leaves numerous, rosulate, 30 cm. long, covered with fine subappressed cinereous scales; sheaths suborbicular, 4 cm. long, brown; blades very narrowly triangular, filiform-acuminate, 15 mm. broad at base, involute; scape erect or suberect, slender; scape-bracts densely imbricate, suborbicular, 2 cm. long, membranaceous, strongly nerved, lepidote, long-flagellate with contorted linear blades; inflorescence subdigitate from about 7 spikes; primary bracts like the scape-bracts but with little or no blade, erect; spikes divergent to spreading from the apex of a long slender erect sterile base, narrowly lanceolate, acuminate at both ends, 4-7 cm. long, 1 cm. wide, strongly complanate, densely few-flowered; rhachis narrowly winged; floral bracts lanceolate, obtuse, to 24 mm. long, exceeding the sepals, ecarinate, thin, strongly nerved, lepidote; sepals oblong-elliptic, obtuse, 16 mm. long, even, glabrous, lustrous; capsule slenderly cylindric, 33 mm. long. Pl. I, fig. 9: Spike x 1; fig. 10: Sepal x 1.

Type in the U. S. National Herbarium, No. 1,196,256, collected on tree, dry hill, Portovelo (Gold Mine near Zaruma), Province of Oro, Ecuador, altitude 600-1000 meters, August 30-September 1, 1923, by A. S. Hitchcock (No. 21245). Isotypes in the Gray Herbarium and in the herbarium of the New York Botanical Garden.

In the absence of complete flowers I am arbitrarily assigning this novelty to Tillandsia since species of this general habit are about evenly divided between Tillandsia and Vriesia.

TILLANDSIA PACHYAXON L. B. Smith, sp. nov.

A T. pastensis André, cui affinis, inflorescentia laxiore per anthesin axi robustissimo haud omnino obtecto, bracteis primariis suborbicularibus, spicis late ovatis differt.

Flowering plant probably well over 1 meter high; leaves presumably rosulate, 7 dm. long, obscurely brown-punctulate-lepidote; sheaths broadly elliptic, nearly as long as the blades and slightly darker; blades narrowly lanceolate, acuminate, 7 cm. wide, flat; scape erect, stout; scape-bracts densely imbricate, subfoliaceous with conspicuous blades; inflorescence subdensely bipinnate, cylindric, 6 dm. long (! Hitchcock); axis 12 mm. in diameter, strongly sulcate; primary bracts suberect, suborbicular, the lowest with triangular subfoliaceous apices and exceeding the axillary spikes, the highest merely apiculate; spikes subsessile, broadly ovate, acute, strongly complanate, 5 cm. long, 3 cm. wide; floral bracts ovate, cucullate-inflexed at apex, slightly exceeding the sepals, carinate, coriaceous, faintly nerved when dry, soon glabrous; sepals elliptic, obtuse, 25 mm. long, ecarinate, equally very short-connate, sparsely lepidote; petal-blades elliptic, 10 mm. long, light purple (! Hitchcock). Pl. I, fig. 11: Primary bract and spike x 1/2; fig. 12: Sepals x 1.

Type in the U. S. National Herbarium, No. 1,196,457, collected on tree, between Cuenca and Huigra, Provinces of Azuay and Cañar, Ecuador, altitude 2700-3000 meters, September 12-13, 1923, by A. S. Hitchcock (No. 21672). Isotypes in the Gray Herbarium and in the herbarium of the New York Botanical Garden.

PERU

PUYA ANGULONIS L. B. Smith, sp. nov.

P. isabellina Mez et P. dolichostrobila Harms in systema Mezii proxima sed bracteis lucidis valde pectinato-serratis differt.

Flowering about 1 meter high; leaves ca. 5 dm. long (! photo); sheaths suborbicular (inner leaves), glabrous; blades linear-triangular, acuminate, pungent, laxly serrate with brown curved spines 4 mm. long, glabrous and lustrous above, covered with fine appressed cinereous scales beneath; scape erect, ca. 1 cm. in diameter; scape-bracts erect, densely imbricate, the lower foliaceous, the upper ovate with a small foliaceous blade, pectinate-serrate, sublustrous, sparsely lepidote; inflorescence simple, strobilate, cylindric, 5 dm. long, 4 cm. in diameter; floral bracts erect, ovate, acuminate, pungent, 3-7 cm. long, pectinate-serrate, obscurely nerved and rugose, nearly glabrous, lustrous; pedicels obconic, 7 mm. long, compressed and bialate with the wings continuing on the keels of the posterior sepals, sparsely white-stellate; sepals lanceolate, obtuse, 20 mm. long, sulcate, sublustrous, sparsely white-stellate; petals acute, 5 cm. long, about equaling the stamens, lilac (! Angulo) drying yellow, naked. Pl. I, fig. 13: Floral bract x 1; fig. 14: Flower x 1; fig. 15: Anterior sepal x 1.

Type in the U. S. National Herbarium, No. 2,253,857, collected on rocky ground, between Motil and Shorey, Province of Otuzco, Department of La Libertad, Peru, altitude 3200 meters, August 10, 1952, by N. Angulo (No. 1708). Isotype in the herbarium of the Universidad Nacional de Trujillo.

Plate I

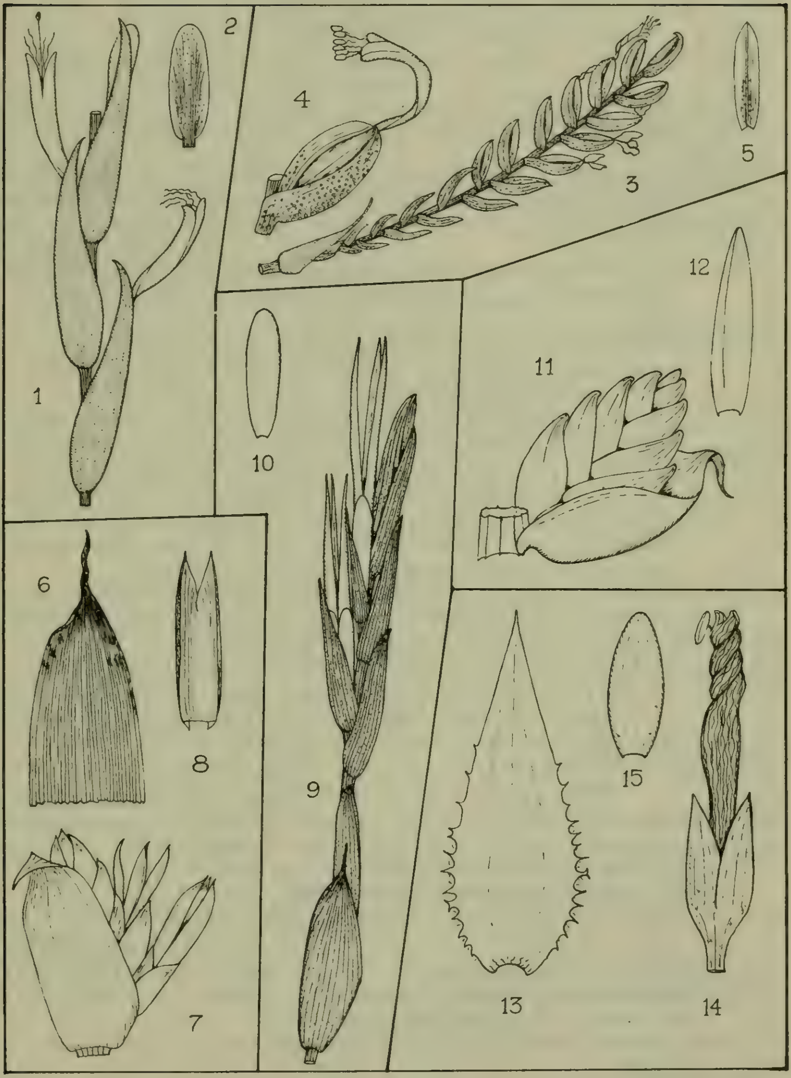

Fig. 1, 2: Tillandsia socialis; fig. 3-5: T. steiropoda; fig. 6-8: T. aequatorialis; fig. 9, 10: T. flagellata; fig. 11, 12: T. pachyaxon; fig. 13-15: Puya angulonis.

MATERIALS TOWARD A MONOGRAPH OF THE GENUS *CITHAREXYLUM*. II

Harold N. Moldenke

1. Modern living species.

2. Branches and branchlets armed with spines. Section I. *Spinosae* Walp.

3. Spines often absent from the twigs; leaf-blades very firmly chartaceous, barbellate in the axils of the secondaries beneath; Brazil, Argentina, Paraguay, and Uruguay......... *C. montevidense*.

3a. Spines conspicuous even on twigs; leaf-blades chartaceous or submembranous, not barbellate beneath; Bolivia and Peru.

4. Branches and branchlets very acutely tetragonal, conspicuously 4-margined, straight, not especially stiff; nodes conspicuously annulate.

5. Leaf-blades mostly serrate, chartaceous, densely impressed-punctate beneath; Peru............*C. herrerae*.

5a. Leaf-blades entire, submembranous, not impressed-punctate beneath; Bolivia and Peru........*C. andinum*.

4a. Branches and branchlets mostly obtusely tetragonal or subterete, not margined, often more or less flexuous, very stiff; nodes usually obscurely annulate.

6. Leaves glabrous or only slightly appressed-pilose along the midrib beneath..............*C. psilacanthum*.

6a. Leaves rather densely pubescent beneath.

7. Petioles 1--3 mm. long; branches usually not flexuous; leaf-blades 0.7--1.7 cm. long, 3.5--10 mm. wide; racemes to 1 cm. long...............*C. weberbaueri*.

7a. Petioles 3--15 mm. long; branches mostly flexuous; leaf-blades 2.2--5.8 cm. long, 7--30 mm. wide; racemes 1.5--2.5 cm. long..............*C. flexuosum*.

2a. Branches and branchlets not armed. Section II. *Inermia* Walp.

8. Leaves very small, 2--15 mm. long, 1--4 mm. wide, sessile, clustered on abbreviated spurs; plants with the aspect of *Lycium barbinode*; Mexico and Texas.

9. Leaf-blades densely canescent-pubescent on both surfaces *C. brachyanthum*.

9a. Leaf-blades glabrous on both surfaces...*C. spathulatum*.

8a. Leaves mostly larger, usually petiolate; plants not with the aspect of *Lycium barbinode*.

10. Leaf-blades linear, linear-oblong, or linear-oblanceolate.

11. Racemes 1--3 cm. long, with numerous flowers; leaf-blades firmly chartaceous or subcoriaceous when mature; vein and veinlet reticulation prominulous and conspicuous throughout on both surfaces; Haiti....... *C. stenophyllum*.

11a. Racemes very much abbreviated, 1--5-flowered, inconspicuous; leaf-blades chartaceous or membranous; vein and veinlet reticulation obscure.

12. Leaf-blades densely strigillose-roughened on both surfaces with minute albidous bulbous-based hairs.*C. shrevei*.

12a. Leaf-blades smooth or merely punctate on both surfaces, not strigillose-roughened.

13. Mexican; branches blackish; fruiting-pedicels 4--7 mm. long; fruiting-calyx indurated, 2.5--3 mm. long and 4.5 --5 mm. wide..............................*C. lycioides*.

13a. Haitian; branches very light-colored; fruiting-pedicels greatly abbreviated; fruiting-calyx about 2 mm. long and 4 mm. wide..................*C. microphyllum*.

10a. Leaf-blades not as above.

14. Leaves ternate or quaternate.

15. Leaves ternate; leaf-blades not tomentose.

16. Leaf-blades sharply toothed...........*C. quercifolium*.

16a. Leaf-blades entire.

17. Native to Cuba and Central America.

18. Leaf-blades 9.8--25 cm. long, 5.5--9.2 cm. wide, broadly elliptic-oblong or subobovate; petioles 2-- 3.7 cm. long; Panama..............*C. macrochlamys*.

18a. Leaf-blades 5--16.2 cm. long, 2.4--5.5 cm. wide, lanceolate, lanceolate-oblong, elliptic, narrowly oblong-elliptic, or nearly oblong; petioles 0.6-- 1.9 cm. long.

19. Cuban; leaf-blades very shiny above, dark-green; peduncles and rachis glabrous........*C. ternatum*.

19a. Central American; leaf-blades dull, grayish-green; peduncles and rachis puberulent.......... *C. hexangulare*.

17a. Native to South America.

20. Leaf-blades subtruncate at the base; Brazil........ *C. subtruncatum*.

20a. Leaf-blades short-acuminate, acute, or rounded at the base.

21. Leaf-blades 1.5--3 cm. wide, grayish-green; Paraguay...................................*C. rigidum*.

21a. Leaf-blades 3.3--12.3 cm. wide, dark-green.

22. Petioles 1--4 cm. long; leaf-blades firmly chartaceous.

23. Leaf-blades ovate or ovate-elliptic.......... *C. poeppigii* var. *margaritaceum*.

23a. Leaf-blades elliptic, elliptic-oblong, oblong, or subobovate.

24. Mature leaf-blades densely short-pubescent beneath........................*C. poeppigii*.

24a. Mature leaf-blades minutely puberulent or glabrous beneath or hirtellous along the larger venation only.

25. Mature flowers 14.5 mm. long; Colombia and Guiana..............*C. macrophyllum*.

25a. Mature flowers 11.8 mm. long; Brazil and Ecuador.

26. Leaf-blades hirtellous along the larger venation beneath................*C. ulei.*

26a. Leaf-blades completely glabrous beneath. *C. ulei* var. *calvescens.*

22a. Petioles 5--6.5 cm. long; leaf-blades thin-chartaceous or membranous............*C. amazonicum.*

15a. Leaves quaternate; leaf-blades densely tomentose beneath; exceptional form.........................*C. kunthianum.*

14a. Leaves not ternate nor quaternate.

27. Leaves alternate.........................*C. obtusifolium.*

27a. Leaves decussate-opposite, rarely subopposite or approximate on young shoots.

28. Leaf-blades dentate along the margins.

29. Leaf-blades coriaceous or subcoriaceous.

30. Racemes greatly abbreviated, to 4 cm. long, mostly much less.

31. Leaf-blades merely subcoriaceous.

32. Branchlets and twigs mostly verruculose with numerous prominent lenticels; leaves blackening in drying; mature leaf-blades 7--12 mm. wide........ *C. pachyphyllum.*

32a. Branchlets and twigs not verruculose; leaves not discoloring in drying; mature leaf-blades 8--40 mm. wide.......................*C. ilicifolium.*

31a. Leaf-blades firmly coriaceous or leathery-coriaceous.

33. Leaf-blades extremely heavy leathery-coriaceous and stiff, usually nigrescent or brunnescent in drying; racemes 1--3.5 cm. long, mostly with numerous flowers......................*C. dentatum.*

33a. Leaf-blades not so extremely heavy and stiff, not discoloring in drying; racemes greatly abbreviated, 1--5-flowered.

34. Leaf-blades deeply impressed-punctate on both surfaces; teeth few, small, appressed, obscure, often absent.....................*C. punctatum.*

34a. Leaf-blades impressed-punctate only beneath; teeth very large, divergent, conspicuous, always present...............*C. argutedentatum.*

30a. Racemes elongate, 4--25 cm. long.

35. Vein and veinlet reticulation obscure on both surfaces or even indiscernible; Mexico.*C. ligustrinum.*

35a. Vein and veinlet reticulation conspicuous.

36. Peduncles and rachis very stout and strong, erect; pedicels obsolete; Peru and Bolivia........ *C. laurifolium.*

36a. Peduncles and rachis slender during anthesis, often nutant; pedicels 1--2 mm. long.

37. Midrib and secondaries deeply impressed above

or sharply prominulent within a rather deep channel; racemes to 2.4 cm. wide during anthesis; calyx about 4.1 mm. long and 3.9 mm. wide; corolla about 8.3 mm. long; Colombia........................*C. sulcatum*.

37a. Midrib and secondaries plane or conspicuously prominulous above; racemes about 1.3 cm. wide during anthesis; calyx and corolla smaller; Peru........... *C. suberosum*.

29a. Leaf-blades chartaceous or membranous.

38. Leaf-blades decidedly scabrous above...........*C. scabrum*.

38a. Leaf-blades not scabrous above.

39. Leaf-blades small, 0.6--7.2 cm. long, 0.7--4.5 cm. wide.

40. Leaf-blades flabelliform............*C. flabellifolium*.

40a. Leaf-blades not flabelliform.

41. Native to South America.

42. Leaf-blades densely punctate beneath; flowers yellow; Argentina.....................*C. jörgensenii*.

42a. Leaf-blades not punctate; flowers white; Brazil... *C. reitzii*.

41a. Native to Mexico and southern United States.

43. Racemes densely many-flowered; branches, branchlets, and twigs light-gray...............*C. berlandieri*.

43a. Racemes 1--5-flowered; branchlets and twigs dark-brown or black.

44. Petioles to 14 mm. long; leaf-blades not revolute, their teeth mostly absent.........*C. altamiranum*.

44a. Petioles to 6 mm. long; leaf-blades coarsely and deeply dentate with large, antrorse, often lobe-like teeth, revolute at the margins.*C. endlichii*.

39a. Leaf-blades larger, 2.2--29 cm. long, 1.3--11.3 cm. wide.

45. Leaf-blades very firmly chartaceous and stiff; vein and veinlet reticulation very prominent and conspicuous on both surfaces.

46. Teeth regularly present and confined to the apical portion of the leaf-blades, small and more or less appressed-antrorse......*C. fruticosum* var. *subserratum*.

46a. Teeth present only on occasional watersprout leaves and then very large, coarse, divergent-patent, and not confined to the apical portion of the leaf.

47. Leaf-blades glabrous beneath.........*C. fruticosum*.

47a. Leaf-blades villous-pubescent or velutinous beneath................*C. fruticosum* var. *villosum*.

45a. Leaf-blades thin-chartaceous or membranous, not stiff; vein and veinlet reticulation usually not as above.

48. Leaf-blades glabrous or subglabrate beneath.

49. Leaf-blades bicolored, very dark above, very light beneath; vein and veinlet reticulation conspicuous beneath by being darker, but not in the slightest degree prominulous; leaf-blades extremely thin-membranous and fragile................*C. discolor*.

49a. Leaf-blades not noticeably bicolored, usually chartaceous; vein and veinlet reticulation not as above.

50. Leaf-blades narrow, lanceolate or oblong-lanceolate...... *C. donnell-smithii*.

50a. Leaf-blades broad, from elliptic, elliptic-oblong, or oblong to ovoid or subrhomboid.

51. Petioles to 2.4 cm. long; pedicels to 4 mm. long; West Indies to the Guianas.....................*C. spinosum*.

51a. Petioles to 4.2 cm. long; pedicels to 2 mm. long; Mexico...................................*C. mexicanum*.

48a. Leaf-blades variously pubescent beneath.

52. Leaf-blades merely puberulent beneath.

53. Leaf-blades decidedly membranous and bicolored, very dark above, very light beneath; vein and veinlet reticulation conspicuous beneath by its darker color, but not the least prominulous; Cuba and Hispaniola.......*C. discolor*.

53a. Leaf-blades chartaceous, not membranous; vein and veinlet reticulation not as above; Mexico.................. *C. affine* var. *glanduliferum*.

52a. Leaf-blades pubescent, pilose, hirsute, or velutinous beneath.

54. Leaf-blades ovate, broadly rounded at the base, not South American.

55. Leaf-blades acuminate at the apex, to 12.5 cm. long and 6.5 cm. wide.

56. Mexican; leaf-blades permanently short-pubescent on the lamina beneath; branchlets densely pubescent..... *C. ovatifolium*.

56a. Cuban; leaf-blades strigillose-pubescent only in disticous fashion along the larger venation beneath; branchlets obsoletely puberulent or glabrate........ *C. ekmani*.

55a. Leaf-blades acute at the apex, to 9 cm. long and 4.5 cm. wide................................*C. pentandrum*.

54a. Leaf-blades not ovate, from acute or acuminate to cuneate at the base; South American.

57. Brazilian; leaf-blades lanceolate-oblong or elliptic, densely hirsute-tomentose or velutinous-pubescent beneath; fruiting-calyx about 6 mm. long and 12 mm. wide; fruit about 14 mm. long and 12 mm. wide..*C. solanaceum*.

57a. Colombia, Venezuela, and Ecuador; fruiting-calyx 2.5--3 mm. long and 5--9 mm. wide; fruit 5--9 mm. long and 5--7 mm. wide.

58. Ecuador; leaf-blades densely incanous-tomentose beneath, broadly oblong-elliptic or suborbicular, not at all falcate..........................*C. quitense*.

58a. Colombia and Venezuela; leaf-blades merely pubescent, hirtellous, or subvelutinous (and not incanous) beneath, often more or less falcate.

59. Pubescence, especially on the lower leaf-surface, velutinous, very dense................*C. karsteni*.

59a. Pubescence, especially on the lower leaf-surface, not velutinous, short, often sparse..... *C. dawei*.

28a. Leaf-blades entire.

60. Leaf-blades glabrous or subglabrate beneath when mature, rarely pulverulent-punctate or pilosulous on the midrib.

61. Racemes abbreviated, few-flowered.

62. Leaf-blades narrow, linear-oblanceolate or narrowly elliptic-spatulate to narrowly oblong, oblong-oblanceolate, or oblanceolate.

63. Hispaniola; leaf-blades mostly membranous........... *C. microphyllum*.

63a. Mexico; leaf-blades chartaceous, often firm.

64. Twigs acutely tetragonal; fruiting-pedicels 4--7 mm. long; leaf-blades thin-chartaceous; sterigmata present on older branchlets.

65. Leaf-blades densely impressed-punctate beneath, linear-oblong......................*C. lycioides*.

65a. Leaf-blades not impressed-punctate beneath, elliptic............................*C. racemosum*.

64a. Twigs subterete; fruiting-pedicels obsolete or to 3 mm. long; leaf-blades firmly chartaceous; sterigmata absent.

66. Petioles obsolete or to 1 mm. long; leaf-blades to 4 cm. long and to 0.8 cm. wide..*C. tetramerum*.

66a. Petioles 1.5--5 mm. long; leaf-blades to 8.5 cm. long and to 2.8 cm. wide............*C. oleinum*.

62a. Leaf-blades broader, oblong or elliptic.

67. Leaf-blades deeply impressed-punctate above.......... *C. punctatum*.

67a. Leaf-blades not impressed-punctate above.

68. Mature leaves becoming brunnescent or nigrescent in drying; branches, branchlets, and twigs verruculose; vein and veinlet reticulation usually plane or indiscernible above.................*C. pachyphyllum*.

68a. Mature leaves usually not discoloring in drying; branches, branchlets, and twigs not verruculose; vein and veinlet reticulation conspicuous and quite prominulous above...........*C. ilicifolium*.

61a. Racemes elongate, many-flowered.

69. Branches and branchlets conspicuously 4-alate or 4-margined.

70. South American...........................*C. vallense*.

70a. Central American.

71. Branches and branchlets mostly merely more or less acutely tetragonal, very shortly alate-margined only on exceptional vigorous specimens; leaf-blades lanceolate-elliptic or ovate, usually not glanduliferous at the base....................*C. affine*.

71a. Branches and branchlets always conspicuously alate; leaf-blades larger, elliptic, glanduliferous at the base.......................*C. pterocladum*.

69a. Branches and branchlets not conspicuously 4-alate-margined.

72. Leaf-blades mucronate-cucullate at the apex.

73. Leaf-blades narrowly oblong, usually 5--6 times as long as wide.................................*C. mucronatum*.

73a. Leaf-blades obovate or elliptic, usually only 1 1/2 to 2 times as long as wide..................*C. ellipticum*.

72a. Leaf-blades not mucronate-cucullate at the apex.

74. Leaf-blades membranous, often very thin and fragile.

75. Native to Mexico.

76. Nodes distinctly annulate; leaf-blades mostly small and narrow and more or less lanceolate-elliptic or ovate; vein and veinlet reticulation usually more or less obscure beneath.....................*C. affine*.

76a. Nodes very obscurely annulate; leaf-blades mostly larger and broader, oblong-elliptic or ovoid to subrhomboid; vein and veinlet reticulation conspicuous beneath...............................*C. mexicanum*.

75a. Not Mexican.

77. Leaf-blades large and broad, to 29 cm. long and 11.3 cm. wide.

78. Mature leaf-blades uniformly colored on both surfaces, mostly firm; West Indies to the Guianas and Panama................................*C. spinosum*.

78a. Mature leaf-blades much lighter beneath, very thin-membranous; Ecuador and Peru...*C. chartaceum*.

77a. Leaf-blades smaller and narrower, to 11.7 cm. long and 4.5 cm. wide.

79. Mature leaf-blades decidedly bicolored, very dark above in drying, very light beneath; peduncles and rachis glabrous; Hispaniola..,.........*C. discolor*.

79a. Mature leaf-blades not bicolored; peduncles and rachis densely puberulent or short-pubescent and canescent; Trinidad and Cedros...................
C. fruticosum var. *brittonii*.

74a. Leaf-blades chartaceous, subcoriaceous, or coriaceous.

80. Leaf-blades rounded at the base.

81. Leaf-blades large, 10.5--21.5 cm. long, 7.2--10.3 cm. wide; vein and veinlet reticulation equally prominulous and conspicuous on both surfaces; Costa Rica....
C. costaricense.

81a. Leaf-blades small, 3.2--7.3 cm. long, 1.6--3.2 cm. wide; vein and veinlet reticulation usually almost indiscernible above, not at all prominulous beneath; Mexico.............................*C. gleasonianum*.

80a. Leaf-blades acute, acuminate, or cuneate at the base.

82. Native to the West Indies and Florida.

83. Vein and veinlet reticulation very abundant, very conspicuous and prominent on both surfaces.

84. Leaf-blades dull above, not shiny.

85. Leaf-blades usually rounded and emarginate or subcucullate at the apex, not discoloring in

in drying; venation very strong..........*C. ellipticum.*

85a. Leaf-blades usually acute at the apex, nigrescent above in drying (especially the younger ones); venation slender.................................*C. albicaule.*

84a. Leaf-blades very shiny above.

86. Leaf-blades linear or lanceolate to oblanceolate, often falcate....................*C. fruticosum* var. *smallii.*

86a. Leaf-blades usually oblong or elliptic, not at all falcate.

87. Leaf-blades usually small, 2--6 cm. long, 1.5--3.5 cm. wide, mostly obtuse or only subacute at the apex, usually undulate or sinuate to sharp-serrate at the apex or from the apex to the middle; Cuba and Hispaniola.................*C. fruticosum* var. *subserratum.*

87a. Leaf-blades usually larger, 4.5--21 cm. long, to 8 cm. wide, mostly short-acuminate or acute at the apex, uniformly entire (except on sprouts); widely distributed..........................*C. fruticosum.*

83a. Vein and veinlet reticulation usually rather obscure, at least above, or only very slightly prominulous.

88. Leaf-blades pronouncedly and rather long-acuminate at the apex, lanceolate or narrowly ovate; racemes mostly compound with 3 branches...................*C. tristachyum.*

88a. Leaf-blades mostly acute or obtuse (rarely very bluntly short-acuminate) at the apex, mostly oblong or elliptic; racemes usually simple.

89. Vein and veinlet reticulation abundant, usually plainly visible (although but very slightly prominulous) on both surfaces; leaf-blades usually broadly elliptic or elliptic-oblong...........................*C. spinosum.*

89a. Vein and veinlet reticulation very sparse and distant, usually obscure (or the smaller parts even indiscernible) above or on both surfaces; leaf-blades usually narrowly oblong or narrowly elliptic......*C. caudatum.*

82a. Not native to Florida or the West Indies.

90. Native to Mexico and Central America.

91. Veins and veinlets numerous, mostly more or less conspicuous and prominulous on both surfaces.

92. Leaf-blades extremely shiny above, appearing glossy as though varnished; Mexico..................*C. lucidum.*

92a. Leaf-blades dull or subnitid, not appearing as though varnished.

93. Leaf-blades small, 3--9.1 cm. long, 1.5--5.4 cm. wide, obtusely rounded and emarginate or subcucullate at the apex; Mexico (introduced in Cuba)..*C. ellipticum.*

93a. Leaf-blades large, 3.5--29 cm. long, 1.1--11.3 cm. wide, acute or acuminate at the apex.

94. Petioles to 7 cm. long on mature leaves; Mexico.... *C. jurgenseni.*

94a. Petioles 0.6--2.5 cm. long on mature leaves.

95. Leaf-blades usually narrow, lanceolate or lanceo-

late-oblong to narrowly elliptic.

96. Branchlets and twigs decidedly costate with numerous parallel longitudinal ridges; secondaries, tertiaries, and even the veinlets of much lesser rank all rather sharply prominulous above; leaf-blades dull.............................C. hexangulare.

96a. Branchlets and twigs not costate; secondaries and tertiaries often merely rounded above; veinlets of lesser rank usually not prominulous above; leaf-blades shiny.

97. Mature leaf-blades subcoriaceous, with the veinlet-reticulation sharply prominulous beneath..... C. steyermarkii.

97a. Mature leaf-blades firmly chartaceous, with the veinlet-reticulation usually plane or even obscure beneath...............C. donnell-smithii.

95a. Leaf-blades usually broader, elliptic or elliptic-oblong to broadly oblong.

98. Leaf-blades light-green and shiny on both surfaces, not discoloring in drying; vein and veinlet reticulation sharply prominulous and conspicuous to the finest divisions above; racemes to 48 cm. long..... C. standleyi.

98a. Leaf-blades dark-green, usually dull, often discoloring in drying; vein and veinlet reticulation mostly only very slightly prominulous above, the ultimate divisions usually plane; racemes to 35 cm. long, usually much less...........C. spinosum.

91a. Veins and veinlets sparse, usually more or less obscure on both surfaces; secondaries often prominent.

99. Leaf-blades very blunt or only subacite at the apex........ C. caudatum.

99a. Leaf-blades distinctly acute or acuminate at the apex.

100. Leaf-blades bearing a pair of extremely large, prominent, and conspicuous heavy black glands to 4 mm. long at the base..............................C. macradenium.

100a. Leaf-blades not glanduliferous at the base or with only small and inconspicuous glands.

101. Leaf-blades more or less ovate or broadly oblong-elliptic, mostly rounded at the base and but slightly prolonged into the petiole...........C. gleasonianum.

101a. Leaf-blades narrowly elliptic or oblong to lanceolate, acute or acuminate to cuneate at the base and more or less attenuate into the petiole.

102. Secondaries distunctly anastomosing near the margins.

103. Leaf-blades dull or subnitid above; secondaries not prominulous above; petioles slender, 13--20 mm. long..............................C. glabrum.

103a. Leaf-blades very shiny and glossy above; secondaries very conspicuously prominulous above; petioles stout, 6--9 mm. long...........C. fulgidum.

102a. Secondaries not distinctly anastomosing near the margins, often obscure.

104. Petioles 2--4 mm. long..........*C. ligustrinum*.

104a. Petioles 7--20 mm. long.

105. Leaf-blades very shiny, especially above; petioles stoutish; Costa Rica and Panama......... *C. recurvatum*.

105a. Leaf-blades dull, not shiny; petioles very slender; Mexico to Costa Rica....*C. schottii*.

90a. Native to South America.

106. Racemes 1--4.5 cm. long; petioles 2--5 mm. long; leaf-blades usually very small, usually sharp-toothed.......... *C. ilicifolium*.

106a. Racemes mostly 4.5--27 cm. long; petioles mostly 6--32 mm. long; leaf-blades much larger.

107. Vein and veinlet reticulation very prominent and conspicuous above.

108. Leaf-blades obovate or obovate-oblanceolate; petioles very short and indistunct; Colombia to Peru.......... *C. reticulatum*.

108a. Leaf-blades elliptic or oblong-oblanceolate; petioles distinct; northeastern South America.

109. Petioles 4--6 mm. long; leaf-blades not glanduliferous at the base; veinlet reticulation obscure beneath; western Venezuela.............*C. mirifolium*.

109a. Petioles 10--25 mm. long; leaf-blades with 1--3 pairs of small galnds at the base; veinlet reticulation prominulous and conspicuous to the last detail beneath; Trinidad and Tobago to Guiana and eastern Venezuela....................x*C. hybridum*.

107a. Vein and veinlet reticulation obscure, subimpressed, or impressed to merely prominulous above.

110. Flowers sessile.

111. Petioles about 5 cm. long; Colombia.....*C. vallense*.

111a. Petioles 0.5--2.7 cm. long; not Colombian.

112. Peru and Bolivia; petioles 5--10 mm. long; leaf-blades not glanduliferous at the base; midrib sharply prominulous above; rim of fruiting-calyx deeply lobed......................*C. laurifolium*.

112a. Brazil; petioles 10--27 mm. long; leaf-blades with a pair of glands (often very large and prominent) at the base; midrib plane or subimpressed above; rim of fruiting-calyx merely scarious..... *C. laetum*.

110a. Flowers distunctly pedicellate.

113. Leaf-blades narrowly oblong to lanceolate or oblanceolate, gray-green; Brazil and Paraguay.*C. rigidum*.

113a. Leaf-blades broadly oblong, elliptic, or elliptic-oblong to ovate or subobovate; not Paraguayan.

114. Mature leaf-blades coriaceous.

115. Colombia; calyx about 4.5 mm. long and 4 mm.

wide; corolla about 8.3 mm. long........ C. sulcatum.

115a. Peru; calyx about 2.5 mm. long and 2 mm. wide; corolla smaller. C. suberosum.

114a. Mature leaf-blades chartaceous.

116. Leaves normally ternate, with a pair of very large, crateriform, and very conspicuous glands at the apex of the petiole.................... C. macrophyllum.

116a. Leaves normally decussate-opposite; glands, if present, small and more or less inconspicuous.

117. Veinlet reticulation very abundant, prominulous above; leaf-blades glossy; Ecuador................. C. svensonii.

117a. Veinlet reticulation usually obscure or only very slightly prominulous above; leaf-blades usually dull; not Ecuadorean.

118. Leaf-blades small, to 11.5 cm. long and 4 cm. wide; corolla-lobes densely tomentose throughout within, in bud with the white tomentum projecting and conspicuous where the lobes overlap........... C. subthyrsoideum.

118a. Leaf-blades usually large, to 29 cm. long and 11.3 cm. wide; corolla lobes pubescent with brownish hairs only at the center and base within, no pubescence visible from the outside of buds........... C. spinosum.

60a. Leaf-blades tomentose, velutinous, or pubescent to puberulent beneath.

119. Leaf-blades coriaceous or leathery-coriaceous, often very hard and stiff.

120. Petioles 3--4.5 cm. long.

121. Leaf-blades usually subtruncate at the base; Ecuador.. C. rimbachii.

121a. Leaf-blades usually acute at the base; Colombia...... C. dryanderae.

120a. Petioles 0.4--1.1 cm. long.

122. South American; petioles glabrous, verruculose........ C. krukovii.

122a. Central American and West Indian; petioles densely pubescent or furfuraceous, not verruculose.

123. Hispaniola; petioles 4--6 mm. long; leaf-blades 2--4 cm. long; racemes 1--2 cm. long......... C. schulzii.

123a. Guatemala; petioles 6--10 mm. long; leaf-blades 4.2 to 13 cm. long; racemes 7--10 cm. long............. C. crassifolium.

119a. Leaf-blades membranous or merely chartaceous, often very firmly so, but not leathery-coriaceous.

124. Flowers sessile or subsessile.

125. Leaf-blades very densely lanate-tomentose.

126. Rachis during anthesis extremely stout, about 4 mm. in diameter; calyx during anthesis extremely large, 5—6 mm. long and 4 mm. wide.

127. Inflorescence densely many-flowered...*C. montanum*.

127a. Inflorescence very loosely few-flowered.......... *C. montanum* var. *chimborazense*.

126a. Rachis during anthesis more slender, to 2 mm. in diameter; calyx during anthesis smaller.

128. Leaf-blades glanduliferous beneath; tomentum mostly incanous........................*C. kunthianum*.

128a. Leaf-blades not glanduliferous; tomentum mostly flavescent.....................*C. subflavescens*.

125a. Leaf-blades not densely lanate-tomentose.

129. Leaf-blades merely puberulent beneath or distichously short-pubescent only along the midrib..*C. viride*.

129a. Leaf-blades densely short-pubescent over the whole lower surface, especially on the venation.

130. Native to Mexico and Central America.

131. Midrib, secondaries, tertiaries, and veinlets more or less prominulous above; leaf-blades small, 4.7—7.5 cm. long, 1.9—2.6 cm. wide..... *C. integerrimum*.

131a. Midrib and secondaries more or less impressed above; leaf-blades larger, 4.8—20 cm. long, 2.3—8 cm. wide.

132. Leaf-blades puberulent on the lamina beneath in addition to being short-pubescent on the venation..........................*C. cooperi*.

132a. Leaf-blades merely short-pubescent beneath, not also puberulent on the lamina.

133. El Salvador; branchlets and twigs sharply tetragonal, densely puberulent; petioles, peduncles, and rachis densely puberulent.... *C. teclense*.

133a. Mexico; branchlets and twigs obtusely tetragonal, glabrate; petioles, peduncles, and rachis glabrate...............*C. ambiguum*.

130a. Native to South America (introduced in Africa).

134. Branchlets and twigs glabrous; petioles short and stoutish, 5—7 mm. long; Venezuela.......... *C. venezuelense*.

134a. Branchlets and twigs pubescent, hirtellous, or puberulent; petioles 7—35 mm. long.

135. Twigs densely tomentose.

136. Calyx during anthesis 4.5—5.5 mm. long, regularly 5-apiculate.........*C. solanaceum*.

136a. Calyx during anthesis about 8 mm. long, deeply 2-lipped...........................

................C. solanaceum var. macrocalyx.

135a. Twigs merely pubescent or hirtellous to puberulent.

137. Calyx during anthesis 2--2.5 mm. long.

138. Leaf-blades oblong to ovate or ovate-elliptic, to 11.1 cm. long and 4.8 cm. wide.C. karsteni.

138a. Leaf-blades lanceolate or oblong-lanceolate, to 10.5 cm. long and 2.5 cm. wide........... C. karsteni var. lanceolatum.

137a. Calyx during anthesis 3--4.5 mm. long.

139. Nodes obscurely annulate; midrib, secondaries, tertiaries, and veinlet reticulation more or less prominulous above; leaf-blades very short puberulent above or merely punctate; Brazil... C. glaziovii.

139a. Nodes conspicuously annulate; midrib and secondaries often subimpressed above; vein and veinlet reticulation obscure above; leaf-blades scabrellous-strigillose above; Cameroons...........C. solanaceum var. insolitum.

124a. Flowers distinctly pedicellate.

140. Leaf-blades distinctly scabrous above.........C. scabrum.

140a. Leaf-blades not scabrous above.

141. Racemes greatly abbreviated and few-flowered, usually 1-5-flowered.

142. Hispaniola; leaf-blades narrowly oblong or linear, to 6 mm. wide, mostly glabrate or but slightly hirtellous on the larger venation beneath........C. microphyllum.

142a. Mexico; leaf-blades broader, oblong-elliptic or even subrotund, to 22 mm. wide, densely incanous-pubescent or villous to minutely puberulent beneath.

143. Petioles 1--2 mm. long; leaf-blades cuneate at the base and long-attenuate into the petiole.

144. Leaf-blades very densely incanous-pubescent beneath.................................C. rosei.

144a. Leaf-blades only minutely and obscurely puberulent beneath............C. rosei var. durangense.

143a. Petioles 3--14 mm. long; leaf-blades rounded or subacute at the base...............C. altamiranum.

141a. Racemes elongated, many-flowered.

145. Leaf-blades decidedly pubescent, hirtellous, villous, hirsute, or furfuraceous-tomentose to velutinous beneath.

146. Leaf-blades densely furfuraceous-tomentose with many-branched hairs.

147. Calyx during anthesis 2--2.5 mm. long and wide; corolla-limb glabrous or subglabrate on the outside; Mexico to Honduras.

148. Bractlets small, inconspicuous, about 2 mm. long..............................C. mocinni.

148a. Bractlets elongate, linear or spatulate, 4--25 mm. long............*C. mocinni* var. *longibracteolatum*.

147a. Calyx during anthesis about 4 mm. long and 3.5 mm. wide; corolla-limb strigose-pubescent on the outside; El Salvador to Costa Rica..........................*C. lankesteri*.

146a. Leaf-blades velutinous, villous, or hirtellous to pubescent or tomentose with simple hairs.

149. Leaf-blades densely appressed-hirsute beneath............ *C. hidalgense*.

149a. Leaf-blades not hirsute.

150. Leaf-blades densely incanous-tomentose with curved or arched hairs beneath........................*C. quitense*.

150a. Leaf-blades variously villous, hirtellous, or pubescent, but not tomentose; hairs not arched.

151. Leaf-blades very firmly chartaceous when mature; vein and veinlet reticulation very prominent and conspicuous above.

152. Leaf-blades densely long-villous beneath........... *C. fruticosum* var. *villosum*.

152a. Leaf-blades more or less sparsely short-villous or merely pubescent beneath, usually only along the midrib and in the axils of the secondaries......... *C. fruticosum* var. *subvillosum*.

151a. Leaf-blades membranous or chartaceous, not especially firm; vein and veinlet reticulation not especially prominent or conspicuous above.

153. Native to South America.

154. Flowers pseudo-subsecund; racemes to 23 cm. long; Brazil..........................*C. pernambucense*.

154a. Flowers not pseudo-subsecund; racemes 4—14 cm. long; Colombia and Venezuela.

155. Branchlets densely velutinous-pubescent; leaf-blades densely velutinous beneath, not falcate; rim of fruiting-calyx deeply 5-lobed.*C. decorum*.

155a. Branchlets glabrous; leaf-blades densely short-pubescent beneath, not at all velutinous, usually more or less falcate; rim of fruiting-calyx truncate or merely scarious.....*C. dawei*.

153a. Native to Mexico, Central America, or the West Indies.

156. Calyx during anthesis very densely pubescent.

157. Petioles densely pubescent or velutinous........ *C. berlandieri*.

157a. Petioles densely or lightly pilose, not at all velutinous......................*C. pentandrum*.

156a. Calyx during anthesis lightly pubescent or merely puberulent.

158. Leaf-blades ovate or ovoid.

159. Branches very stout, wing-margined; leaf-blades usually densely velutinous-pubescent beneath, not incanous.............*C. hintoni*.

159a. Branches slender, not wing-margined; leaf-blades hirtellous-pubescent with incanous hairs beneath..............*C. ovatifolium*.

158a. Leaf-blades oblong or elliptic.

160. Leaf-blades nigrescent above in drying...... *C. kerberi*.

160a. Leaf-blades bright-green and not at all nigrescent above in drying.

161. Petioles 5--7 mm. long; leaf-blades finely hirtellous beneath; calyx-rim during anthesis deeply lobed; Guatemala to Panama.. *C. hirtellum*.

161a. Petioles 9--16 mm. long; leaf-blades densely short-pubescent or subvelutinous beneath; calyx-rim during anthesis subtruncate; Mexico........*C. bourgeauianum*.

145a. Leaf-blades merely puberulent beneath, or, at least, not usually very densely nor conspicuously pubescent, or pubescent only on the larger venation.

162. Leaf-blades very firmly chartaceous; vein and veinlet reticulation very prominent and conspicuous above.

163. Leaf-blades always entire, mostly acute or short-acuminate at the apex, always puberulent or very short-pubescent beneath, often subvillous along the midrib and secondaries................*C. fruticosum* var. *subvillosum*.

163a. Leaf-blades mostly undulate, sinuate, subserrate, or sharply serrate, rarely entire, mostly rounded at the apex, rarely villous-pubescent beneath................. *C. fruticosum* var. *subserratum*.

162a. Leaf-blades merely chartaceous or membranous, not firm as above; vein and veinlet reticulation not as above.

164. Native to the West Indies.

165. Corolla 4--5 times as long as the calyx............... *C. longiflorum*.

165a. Corolla 2--3 1/2 times as long as the calyx.

166. Leaf-blades very thin-membranous, very fragile, bicolored, very dark above in drying, very light beneath; vein and veinlet reticulation conspicuous beneath by its darker color, but not at all prominulous; racemes simple...................*C. discolor*.

166a. Leaf-blades chartaceous, not especially thin nor fragile, not bicolored, rather uniformly dark-green on both surfaces, nigrescent in drying; vein and veinlet reticulation mostly obscure; racemes mostly compound with 2 branches...........*C. tristachyum*.

164a. Not native to the West Indies.

167. Native to Mexico and Central America.

168. Midrib sharply prominulous above; secondaries, tertiaries, and veinlet reticulation decidedly prominulous above, giving the leaf a roughened aspect; tertiary veins more or less parallel with each other and running at right angles to the midrib; leaf-

blades uniformly light-green on both surfaces. C. hexangulare.

168a. Midrib plane or slightly impressed above; secondaries, tertiaries, and veinlets plane or obscure above, very irregular; leaf-blades not roughened above, very dark-green above, lighter beneath, mostly more or less nigrescent or brunneous in drying.

169. Leaf-blades decidedly puberulent beneath.

170. Leaf-blades thin-membranous....C. sessaei.

170a. Leaf-blades chartaceous.................. C. standleyi var. mexicanum.

169a. Leaf-blades subglabrous or only very sparsely scattered-pilosulous beneath.......... C. affine.

167a. Native to South America.

171. Leaf-blades very large, 16.5--25 cm. long, 7.5 to 12.3 cm. wide; racemes very numerous, often 2 from each axil, often compound.

172. Leaf-blades broadly elliptic, 10--12.3 cm. wide, short-pubescent but not lepidote beneath; racemes to 16 cm. long; peduncles to 2.6 cm. long; flowers rather large.......... C. poeppigii.

172a. Leaf-blades ovate or ovate-elliptic, 7.5--8.8 cm. wide, densely puberulent and lepidote beneath; racemes to 45 cm. long; peduncles to 7 cm. long; flowers smaller...... C. poeppigii var. margaritaceum.

171a. Leaf-blades smaller, 2.5--16.7 cm. long, 1.5-7.2 cm. wide; racemes less numerous, one per leaf-axil, simple.

173. Leaf-blades chartaceous.

174. Petioles 1--2.1 cm. long; leaf-blades to 16.7 cm. long and 7 cm. wide; corolla-tube during anthesis about 15 mm. long; Brazil, Paraguay, and Argentina.....C. myrianthum.

174a. Petioles 2--5 mm. long; leaf-blades to 5 cm. long and 2.2 cm. wide; corolla-tube during anthesis probably 1--3 mm. long; Peru......................C. kobuskianum.

173a. Leaf-blades thin-membranous.

175. Trinidad and Cedros; leaf-blades lanceolate or narrowly elliptic, 2.2--3.2 cm. wide; rachis densely puberulent or shortly canescent-pubescent...................... C. fruticosum var. brittonii.

175a. Ecuador and Peru; leaf-blades broadly elliptic, subobovate, or subrotund, 3.2--7.2 cm. wide; rachis obscurely puberulent or glabrate...............C. chartaceum.

1a. Fossil species.
  176. From rock formations in the United States.
    177. From the Lower Eocene of Mississippi; leaf-blades narrow elliptic, about 8 cm. long and 2.75 cm. wide; secondaries about 12 pairs......................*C. eoligniticum*.
    177a. From the Upper Eocene of Texas; leaf-blades broadly elliptic, about 6.5 cm. long and 3.25 cm. wide; secondaries about 7 pairs........................*C. brazosense*.
  176a. From rock formations outside of the United States.
    178. From the Oligocene of Italy........*C. forsithiaefolium*.
    178a. From the Miocene of Colombia.............*C. retiforme*.

The *Asplund 12692*, tentatively determined as a member of this genus in the Stockholm herbarium, is not verbenaceous.

CITHAREXYLUM AFFINE D. Don, Edinb. New Phil. Journ. 11 (Jan.--Mar.): 238. 1831 [not Mart. & Gal., 1844].

Synonymy: *Citharexylon affine* D. Don ex Walp., Repert. 4: 75. 1845 [not Sessé & Moc., 1940]. *Cytharexylum quadrangulare* Sessé & Moc., La Naturaleza, ser. 2, 1: 103. 1889 [not Jacq., 1760]. *Citharexylum quadrangulare* Sessé & Moc., Fl. Mex., ed. 1, 152. 1894 [not L. 1786, nor Sessé & Moc., 1831, nor Hort. Madrit., 1845, nor Schau., 1864, nor Millsp., 1907, nor Boutelou, 1909, nor Griseb., 1909, nor Jacq., 1909, nor A. Rich., 1909, nor Hort., 1911]. *Citharexylum emrickianum* Greenm., Field Mus. Publ. Bot. 2: 187. 1907. *Cytharexilum paztqarense* Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 24, in syn. 1940. *Cytharexilum quadrangulare* Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 24, in syn. 1940. *Citharexylum quadrangulata* Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 55, in syn. 1940. *Citharexylum affinis* D. Don ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941.

Literature: D. Don, Edinb. New Phil. Journ. 11 (Jan.--Mar.): 238. 1831; Walp., Repert. 4: 75. 1845; Schau. in A. DC., Prodr. 11: 611. 1847; Sessé & Moc., La Naturaleza, ser. 2, 1: 103. 1889; Sessé & Moc., Pl. Nou. Hisp., ed. 2, 96. 1893; Jacks., Ind. Kew. 1: 549. 1893; Sessé & Moc., Fl. Mex., ed. 1, 152. 1894; Sessé & Moc., Fl. Mex., ed. 2, 166. 1896; Greenm., Field Mus. Publ. Bot. 2: 187. 1907; Junell, Symb. Bot. Upsal. 4: 46 & 47. 1934; Moldenke, Alph. List Common Names 2, 7, 8, & 16. 1939; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Prelim. Alph. List Invalid Names 15, 24, & 55. 1940; Moldenke, Suppl. List Invalid Names 2. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Invalid Names 13--15 & 23. 1942; Moldenke, Phytologia 2: 95. 1944; Moldenke, Castanea 10: 43. 1945; Moldenke, Alph. List Cit. 1: 11, 35, 36, 122, 200, 202--204, 241, 242, 298, 299, 301, 304, 306, 308, 317, 319, & 322. 1946; Moldenke, Phytologia 2: 383. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 58. 1948; Moldenke, Alph. List Cit. 2: 327, 332, 337, 339, 342, 345, 393, 419, 420, 425, 426, 431, 436, 447, 459, 460, 498--502, 539--541, 571, 607, 631, 638, & 645 (1948), 3:

687, 694, 705, 729, 730, 750, 759, 768, 785, 788, 808, 830, 873, 886, 898, 904, & 926 (1949), and 4: 1022--1026, 1032, 1041, 1042, 1049, 1051, 1053, 1055, 1072, 1095, 1223, & 1235--1237. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 28, 157, & 178. 1949.

Shrub or spreading tree, to 10 m. tall; stems to 20 cm. in diameter; branches often quite stout, acutely tetragonal, very medullose, striate, glabrous; branchlets more slender, green, more or less acutely tetragonal or even 5-angled, sometimes alate-margined, medullose, glabrous; nodes very distinctly annulate; principal internodes 0.5--7 cm. long; leaf-scars very prominent, corky; leaves decussate-opposite; petioles slender, weak, 1--4 cm. long, glabrous, canaliculate and reddish above; leaf-blades thin-chartaceous or membranous, very dark-green above, lighter beneath, lanceolate-elliptic or ovate, 4--15.5 cm. long, 1.4--8.5 cm. wide, acute or very short-acuminate at the apex, entire, acute (or occasionally slightly prolonged into the petiole) at the base, usually glabrate on both surfaces, sometimes punctate or lightly puberulent beneath, usually not glanduliferous at the base, occasionally more or less hirsute-pubescent (especially on the petiole and midrib beneath) when very immature; midrib slender, prominent beneath, slightly impressed above; secondaries slender, 5--10 pairs, arcuate-ascending (or occasionally hardly arcuate), faintly anastomosing at the margins; veinlet reticulation very fine and delicate; racemes solitary, opposite, axillary or terminating short axillary several-racemed twigs, slender, 9--30 cm. long, 1--2 cm. wide, densely many-flowered; peduncles slender, 0.9--3 cm. long, glabrate; rachis slender or rather stout, glabrous or puberulent, striate; pedicels filiform, 1--2 mm. long, glabrous or puberulent, incrassate and elongate to 3 (or 6) mm. in fruit; prophylla setaceous, often reflexed; flowers numerous, 5--6 mm. long during anthesis, scented; calyx cyathiform or tubular-campanulate, membranous, about 3 mm. long, 5-veined, 5-angulate in cross-section, glabrous on the outside, pubescent within, the rim truncate, ciliate-pubescent, very shortly 5-denticulate; corolla about twice as long as the calyx, white or varying to blue, purple, lilac, or violet, the 2 upper lobes purple-striate, its tube slightly longer than the calyx, pubescent in the throat, otherwise glabrous, the lobes subrotund; fruiting-calyx cupuliform, indurated, to 3.5 mm. long and 4.5 mm. wide, subtruncate or obsoletely 5-apiculate-toothed or shallowly 5-triangular-toothed, lightly puberulent or glabrate, the margin mostly short-pubescwnt and ciliate; fruit oblong or subglobose, varying from salmon or dull-orange to red or red-violet, turning black when ripe and in drying, shiny, 3--10 mm. long, 3--5 mm. wide, 2-lobed, apiculate at the apex, glabrous, always 2-seeded, much eaten by birds.

The type of this common species was collected by G. Andrieux (no. 135) at Chalco, in the state of México, Mexico, on May 14, 18-- (before 1832), and isotypes are widely distributed in leading herbaria. The type of C. emrickianum was collected by G. M. Emrick (no. 179) -- in whose honor it was named -- at the Hacienda Goahuayule, Michoacán, Mexico, in February, 1901, and is deposited in the herbarium of the Chicago Natural History Museum. It represents a form of the species with winged-margined branches and somewhat thicker leaf-blades, which often bear two indistinct glands at their base. It is thus intermediate between typical C. affine and typical C. pterocladum Donn. Sm., and ought perhaps rather to be included with the latter species.

The Citharexylum affine Mart. & Gal. referred to in the synonymy is actually C. hexangulare Greenm. The type of Cytharexylum quadrangulare Sessé & Moc. was collected by Martin Sessé, José Mariano Mociño, Castillo, and Maldonado (no. 2371) at Patzquari and Coahuayana, Michoacan, Mexico. They thought that the plant which they collected was the Citharexylum quadrangulare of Linnaeus, Syst. Veg. 472, and of Jacquin, Select. Stirp. Amer. 185--186, pl. 117 & 118 (1763). However, Cytharexylum quadrangulare Jacq., Citharexylum quadrangulare Jacq., C. quadrangulare Schau., C. quadrangulare L., and C. quadrangulare Hort. are all synonyms of C. spinosum L. On the other hand, Citharexylum quadrangulare Boutelou and C. quadrangulare Hort. Madrit. are C. pentandrum Vent., while C. quadrangulare Griseb. is C. fruticosum L., C. quadrangulare A. Rich. is C. caudatum L., and C. quadrangulare Millsp. is C. schottii Greenm.

Langlassé describes C. affine as a tree 8--10 m. tall, while other collectors designate it as a "bushy shrub" or as a "weak shrub". Pringle states that it attains a height of from 15 to 20 feet. It inhabits open valley lands and hillslopes above rivers, pine woods, and pine-oak forests, and ascends from 15 meters altitude in Sinaloa and Nayarit to 2900 meters in the state of México. Morton and Makrinius describe the species as a "shrub with green, angled, and winged branchlets; petioles channeled and reddish above; corolla lilac, the 2 upper lobes purple-striate, coll. at alt. of 400--650 m.", while on the Washington specimen they say "branchlets 5-angled". It has been collected in anthesis in January, February, and from April to November, and in fruit in February and from April to November. The fruits are extensively fed upon by birds and are also eaten by children because of their sweet flesh. Kerber reports that the leaves are used in applications against swellings. The flowers have been variously described as lavender or bluish, or, by some, as pink with a white throat. Among its vernacular names reported are "alacate", "cacachila", "canutillo", "chachalaca", and "jalacate! Gerth van Wijk records "savanna wattle" as possibly applying to "C. quadrangulare Moc. et Sessé." Cooper says that it "would be suitable for a screen or low wind break" in Kenya. The Howell 8505, cited below, is inscribed "Cultivated?"

The stout (often hollow), striate, glabrous, acutely angled branches, conspicuously annulate nodes, and prominent leaf-scars are characteristic. The racemes are often pendent and then the pedicels become reflexed so that the flowers and fruits still point upwards. The annulations at the nodes are often extremely conspicuous. The typical shape of the mature fruits is oblong; subglobose ones are doubtless immature. Occasionally specimens will be found (e.g., Lamb 429 in the Missouri Botanical Garden herbarium) with the smaller leaves obtuse at the apex. The larger leaves, however, are typically acute or shortly acuminate. On some specimens, notably Edw. Palmer 94 at Copenhagen, the branches are not only very sharply 4-angled, but are 4-winged as well. Lamb 429 and 610 were erroneously distributed originally under the name of Duranta plumieri Jacq. Lamb 610 in some herbaria is mixed with Pisonia aculeata L. Lamb 610 and Nelson 4311 at the Gray Herbarium were compared by Casimir de Candolle with the isotype of C. affine in the DeCandolle Herbarium at Geneva and were determined by him as this species. Pringle 6647 is rather anomalous in having its younger parts -- twigs, petioles, and leaf-blades (especially the larger venation beneath) -- hirsute-pubescent, but this pubescence is apparently soon lost as the parts mature. The entire plant, however, retains a more or less puberulent-pulverulent aspect not seen on typical material of this species. Rose, Standley, & Russell 14343 at the New York Botanical Garden also exhibits this grayish-pulverulent aspect throughout.

The Langlassé 210 collection cited below as from Guerrero may actually have come from Michoacán instead, since its labels are merely inscribed "Delta de las Balsas". Gonzales Ortega 86 is inscribed "San Ignacio, Agua Caliente": I am assuming that this was from the state of Aguascalientes.

It is perhaps worth noting that Sessé & Moc̃ino originally published the name of their plant as "Cytharexylum quadrangulare" in 1889 and wrote it that way also in their Pl. Nou. Hisp., ed. 2, 96 (1893). In 1894 they corrected it to "Citharexylum quadrangulare" in edition 1 of their Fl. Mex., p. 152, and maintained the corrected form in edition 2, p. 166 (1896) of this work.

The gynoecium morphology of the species is discussed by Junell in the reference cited above, where he notes a striking resemblance to that of Baillonia amabilis Bocq. In all, 170 herbarium specimens, including the type collections of all the names involved, and 26 mounted photographs have been examined.

Citations: MEXICO: Aguascalientes: J. Gonzales Ortega 86 (Me). Colima: Kerber 169 (B); Edw. Palmer 94 (Cp, Fs, L, Mi, N--photo, S, W--398847, Z--photo), 1326 (A, B, Bm, Cb, Cb, F--185316, G, K, L, N, Ut, W--208876). Guerrero: J. T. Howell 8505 (Gg--272144); Langlassé 210 (B, Cb, Cb, G, K, N, P, W--385784); Lemmon & Lemmon 346 (Ca--153928). Jalisco: Beechey s.n. (K). Maria Madre Island: E. W. Nelson 4311 (Cb, F--600610, G, W--346055). México: Andrieux 135 [Macbride photos 7877] (B--photo of isotype, B--photo of isotype, Dc--isotype, F--645687--photo of isotype, K--isotype, K--isotype, Kr--photo of isotype, Mu--746--isotype, N--photo of isotype, N--photo of isotype, P--isotype, S--photo of isotype, V--isotype, Z--photo of isotype); Beauchamp s.n. [Amecameca] (E--

933652, La); G. L. Fisher 281 (W--1207680), 283 (W--1207681), s.n. [Amecameca, July 24, 1924] (E--912893, F--554810, Hp); Hinton 317 (K, Me), 2042 (K, N), 2367 (F--879159, K, N), 9011 (Au, N); Matuda 32243 (Ss); Matuda & al. 28276 (Ss), 30899 (Z); Pringle 6647 (A, B, Bm, Br, Ca--104979, Cb, Cm, D, E--119121, Ed, F--50232, G, Io--38740, J, K, L, Me, Me, Me, Mi, Mu--3707, N, N--photo, P, S, V--2807, Vt, Vu, W--316879, X, Z--photo); Rutten & Rutten-Pekelharing 790 (Ut). Michoacán: Emrick 179 (B--photo, F--19580--photo, F--95639, K--photo, K--photo, N--photo, S--photo, Z--photo); Sessé, Mociño, Castillo, & Maldonado 2371 [Macbride photos 30833] (F--851475, F--929217--photo, N--photo, Q, Z--photo, Z--photo), 2372 (F--849476, Q). Nayarit: Ferris 5806 (A, Du--193992, W--1491659); J. Gonzales Ortega 59 (Me), 93 (W--1169227); J. Gregg 917 (E--119045, E--119113), s.n. [1848--1849] (E--119046); Lamb 610, in part (Cb, Du--9530, G); Maltby 37 (W--314789); Mexia 518 (B, Cp, Du---175394, La, W--1317815), 584 (A, Bm, Ca--349668, Cb, E--957554, F--689290, Gg--155862, Mi, N, W--1317818); F. W. Pennell 19948 (D--773321, W--1642124); J. N. Rose 1436 (W--300262), 1439 (F--216150, W--300270); Rose, Standley, & Russell 14182 (G, W--637039), 14343 (N, W--637212); Viereck 1188 (B). Oaxaca: Morton & Makrinius 2300 (F--823562, K, W--1585341); Reko 4058 (W--1012235). Sinaloa: J. Gonzales Ortega 343 (K), 4209 (W--1038498), 5430 (A, Ca--406443, K, Me, Me, N--photo, W--1207528, Z--photo), 5874 (W--1209626), 6438 (B, D--650884, Du--170401, G, Mu, W--1269675); Lamb 429 (Du--9519, E--119001, F--160382, N, W--275349); Nervaez Montes & Salazar 343 (W--1035242); Rose, Standley, & Russell 14785 (F--531497, G, P, W--637666). State undetermined: Andrieux 115 (Cb); Herb. Pavon s.n. [Pathguarem] (X); W. Schaffner 487 (B, B); Schnée s.n. (N, P, P, P). CULTIVATED: Kenya: A. M. Cooper H.63/44 (N).

CITHAREXYLUM AFFINE var. GLANDULIFERUM Moldenke, Geogr. Distrib. Avicenn. 13, nom. nud. (1939), Phytologia 1: 412--413.1940.

Literature: Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Phytologia 1: 412--413. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Cit. 2: 541. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 28 & 179. 1949.

This variety differs from the typical form of the species in its broadly ovate leaf-blades, which are to 12 cm. long and 6.5 cm. wide, irregularly sharp-dentate along the margins when mature, puberulent throughout on the lower surface, and glanduliferous with several brown disk-like glands along the midrib and at the base beneath. The sharply tetragonal and glabrous branches, branchlets, and twigs are many-striate and abundantly impressed glandular-punctate (!).

The type of the variety was collected by George B. Hinton (no. 7344) in oak woods at Yperricones, Temascaltepec, in the state of México, Mexico, on February 7, 1935, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. The collector states that the plant was 3 m. tall. The glands on the lower leaf-surface of this variety are discoid, like those seen in many species of Aegiphila Jacq., and not elongate as in most other members of the genus Citharexylum. Two herbarium specimens have been examined.

Citations: MEXICO: México: Hinton 7344 (K--type, N--isotype).

CITHAREXYLUM ALBICAULE Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 208. 1863.

Synonymy: Citarexylum albicaule Turcz. ex León & Alain, Fl. Cuba 4: 299 & 350. 1957.

Literature: Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 208. 1863; Jacks., Ind. Kew. 1: 549. 1893; O. E. Schulz in Urb., Symb. Ant. 6: 56 & 60. 1909; Moldenke, Geogr. Distrib. Avicenn. 5. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 24 & 88. 1942; Moldenke, Alph. List Cit. 2: 349 (1948) and 3: 889. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 43 & 179. 1949; Moldenke, Rev. Sudam. Bot. 8: 172. 1950; Alain in León & Alain, Fl. Cuba 4: 299. 1957.

Shrub or tree; branches and branchlets medium-stout, white or very light-gray, acutely or obtusely tetragonal, rather obscurely striate, glabrous; young shoots slender, tetragonal or subterete, striate, becoming black in drying, glabrous; nodes annulate, often only obscurely so; leaf-scars elevated 1--5 mm. on very prominent and corky sterigmata; principal internodes 1.5--5 cm. long; leaves decussate-opposite (or approximate on young shoots); petioles slender, often nigrescent in drying, 5--17 mm. long, glabrate; leaf-blades chartaceous and nigrescent in drying when immature, subcoriaceous and not nigrescent in drying when mature, uniformly colored on both surfaces and subnitid when mature, narrowly elliptic or oblanceolate, 4.5--9.2 cm. long, 1.3-3.1 cm. wide, acute or obtuse at the apex, entire, often very slightly revolute in drying, cuneately attenuate to the 2-glandular base, glabrous on both surfaces; midrib slender, prominent beneath, prominulous above; secondaries slender, 3--5 pairs, arcuate-ascending, rather obscurely anastomosing at the margins with the veinlet reticulation prominulous on both surfaces; racemes spiciform, 6--10 cm. long, 1 cm. or less wide, many-flowered, terminal and terminating short axillary shoots; peduncles slender, abbreviated, 5--12 mm. long, glabrous; rachis slender, glabrous, often blackish in drying; pedicels obsolete or to 0.8 mm. long; prophylla setaceous, minute; flowers erect-spreading; calyx cyathiform, about 3 mm. long, glabrous outside, the rim plainly 4- or 5-dentate, slightly ciliolate, the teeth unequal, about 1 mm. long, often connate in pairs; corolla in bud subhypocrateriform, about 5 mm. long, not quite twice as long as the calyx, glabrous outside, villous in the throat, otherwise glabrous within, the lobes suborbicular, glabrous, about 1/3 the length of the tube; stamens 4, the fifth one rudimentary; filaments very short; anthers longer than the filaments; mature flowers, fruiting-calyx, and fruit not known.

The type of this species was collected by Ramón de la Sagra (no. 213) somewhere in Cuba. The type collection has been variously identified as "Duranta sp.", "Citharexylum coriaceum ?", and "aff. C. quadrangulare". Although Turczaninow does not cite any number in his original description, Sagra's no. 213 is doubtless the collection on which the species was based, and the type is probably deposited in the herbarium at Kiev, where the non-Siberian portion of Turczaninow's herbarium is preserved. An unnumbered Sagra collection, at first thought to be the one which Turczaninow had before him, has proved to be C. fruticosum var. subvillosum Moldenke.

The present species is remarkable because of its deeply lobed calyx. Its white branches and branchlets are also striking, but similar ones are seen in forms of C. fruticosum L. The differences in the leaf-blade venation mentioned by Schulz and the differences in the color of the branches as emphasized by Turczaninow are not very workable characters for a key. The fact that the young shoots and immature leaves blacken in drying is striking, and, taken in connection with the white branches and branchlets, offers a striking contrast in color on dried specimens. The glands on the leaf-base are oblong and sunken, not prominent. Schulz differentiates it from C. fruticosum in this way: Lateral veins of the leaf-blades prominent beneath; calyx plainly dentate; branchlets obtusely tetragonal....C. albicaule. Lateral veins of the leaf-blades prominent on both surfaces; calyx very shortly dentate; branchlets acutely tetragonal...C. fruticosum. Alain differentiates them in essentially the same manner.

In all, 8 herbarium specimens and 6 mounted photographs and drawings have been examined.

Citations: CUBA: Province undetermined: Sagra 213 (B—isotype, B—photo of isotype, B—drawing of isotype, F—998436—isotype, K—photo of isotype, N—isotype, N—isotype, N—photo of isotype, P—isotype, S—photo of isotype, V—isotype, X—isotype, Z—photo of isotype). CULTIVATED: Cuba: Acuña 15584 (Es).

CITHAREXYLUM ALTAMIRANUM Greenm., Field Columb. Mus. Publ. Bot. 2: 259. 1907.

Literature: Greenm., Field Columb. Mus. Publ. Bot. 2: 259. 1907; Prain, Ind. Kew. Suppl. 4: 49. 1913; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Cit. 1: 307. 1946; Moldenke, Phytologia 2: 330. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 48. 1948; Moldenke, Alph. List Cit. 2: 423 (1948), 3: 679 & 872 (1949), and 4: 1028, 1031, & 1164. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 28 & 179. 1949.

Shrub, to 2 m. tall; branches stout, gray, the bark rough; branchlets short, stout, stiff, acutely tetragonal or obtusely so in age, gray, glabrate, the ultimate ones and young shoots very short, mostly clustered, brown or brownish, hexangular, densely villous-pubescent or short-hirsute with brownish or canescent hairs; principal internodes greatly abbreviated, to 15 mm. long; leaves decussate-opposite, usually more or less clustered on greatly abbreviated shoots; petioles very slender, 3--14 mm. long, rather densely villous or pubescent; leaf-blades chartaceous, somewhat darker above than beneath, oblong-elliptic or subrotund, varying to ovate or ovate-oblong, 0.8--4 cm. long, 0.5--2.5 cm. wide, rounded or obtuse to subacute (rarely emarginate) at the apex, entire or sometimes very irregularly and bluntly toothed or lobed with 1--few very short lobes, rounded or subacute but not glanduliferous at the base, densely villous-pubescent or hirsute-pubescent with short canescent hairs on both surfaces, especially on the larger venation beneath, ciliate along the margins, usually bearing 1--3 disklike glands on the blade; midrib very slender, prominulous beneath, slightly impressed above; secondaries very slender, very few and irregular, often hardly reaching the margins, impressed above; veinlet reticulation very delicate; racemes much abbreviated, spiciform, 1--3 cm. long, 1--4-flowered, terminal, simple, pubescent; peduncles very short, 2--6 mm. long, very slender, weak, villous; rachis very slender, weak, villous; pedicels filiform, about 1 mm. long, villous; prophylla linear, 1--3 mm. long, surpassing the pedicels, villous; flowers not seen; fruiting-calyx campanulate or turbinate to cupuliform, 4--4.5 mm. long, about 6 mm. wide, light, chartaceous, 5-costate or 5-angulate-keeled at the base, each rib ending in a mucronate tooth projecting about 1 mm. above the otherwise subtruncate rim (the teeth erect, acute), slightly pubescent on both surfaces, ciliate on the rim; fruit oblong or oblong-elliptic to subglobose, dark reddish-purple, 6--8 mm. long, 4--5 mm. wide, glabrous, shiny, 2-lobed, 2-seeded; seeds elliptic, 6--7 mm. long, concavo-convex, smooth.

The type of this species was collected by Fernando Altamirano (no. 1566) -- in whose honor it is named -- at the Hacienda del Ciervo, between Del Ciervo and the "mountain of the mesa", Querétaro, Mexico, on August 20, 1905, and is deposited in the United States National Herbarium at Washington. The unnumbered Altamirano specimen cited below is probably part of the type collection. It was collected at the type locality on the same date also by Rose, Painter, & Rose. The species is most distinct; it inhabits mountainous areas, and has been collected only in fruit in August and October. It has the general appearance of C. berlandieri B. L. Robinson, but differs in having smaller leaves, fewer-flowered inflorescences, and in the calyx characters. In all, 10 herbarium specimens, including the type, and 14 mounted photographs have been examined.

Citations: MEXICO: Hidalgo: C. L. Lundell 12558 (Ld). Querétaro: Altamirano 1566 (B--photo of type, F--195704--isotype, F--195704--photo of type, K--photo of type, K--photo of type, N--photo of type, S--photo of type, W--570648--type, Z--photo of type), s.n. [Agosto 20, 1905] (Me); Rose, Painter, & Rose 9666 (E--715405--photo, F--195706, F--195706--photo, W--453156), 10268 (E--717426--photo, F--195708, F--195708--photo, K--photo, N, N, N--photo, W--453770, Z--photo).

CITHAREXYLUM AMAZONICUM Moldenke in Fedde, Repert. Sp. Nov. 37: 216. 1934.

Synonymy: Cytharexylon cinereum L. ex Le Cointe, A Amaz. Brasil. III Arv. & Plant. Uteis 349. 1934 [not Citharexylon cinereum L., 1851, nor Spreng., 1851, nor Citharexylum cinereum L., 1763, nor Sessé & Moc., 1894, nor Donn. Sm., 1907, nor Jacq., 1909].

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 216. 1934; Le Cointe, A Amaz. Brasil. III Arv. & Pl. Uteis 349. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 25. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 36 & 88. 1942; Moldenke, Alph. List Cit. 2: 347 & 448. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76 & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Moldenke, Alph. List Cit. 3: 695 & 955. 1949.

Shrub; branches and branchlets extremely stout, hollow, obtusely 6-angled or subterete, glabrous; nodes rather inconspicuously annulate; leaf-scars large, vertically elongate, not greatly elevated; principal internodes 10--11 cm. long; leaves ternate, very large; petioles comparatively slender, 5--6.5 cm. long, glabrous; leaf-blades thin-chartaceous or membranous, very dark-green and shiny above, much lighter beneath, broadly elliptic, 15--29 cm. long, 7--14.8 cm. wide, broadly short-acuminate at the apex, entire, broadly acute or short-acuminate at the base, with two large elongated lateral glands at the very base, glabrous on both surfaces; midrib rather stout, prominent beneath, prominulous in a very narrow line above; secondaries slender, 7--9 pairs, beautifully arcuate-ascending, prominulous beneath, plainly anastomosing at the margins; veinlet reticulation fine, beautifully conspicuous beneath; racemes axillary and terminal, spiciform, often 2 or 3 from a single axil, 4.5--10 cm. long, about 1 cm. wide, many-flowered, the terminal one on the main branches usually compound with about 4 whorls, each subtended by 2 small bracts, the axillary ones often bearing 1 or 2 short branches at the base of the floriferous portion, subtended by a pair of small bracts; axillary peduncles slender, terminal one stout, 6.5--9.8 cm. long, glabrous or minutely puberulent toward the apex; rachis slender (or the terminal one stout), puberulent or subglabrate; pedicels slender, about 1 mm. long or less, puberulent; bracts linear, 7--11 mm. long, usually upwardly arcuate, puberulent; prophylla minute, setaceous, 1 mm. long or less, puberulent; calyx tubular-obconic, about 4.1 mm. long and 2.1 mm. wide, glabrate, lightly 5-ribbed, its rim truncate and entire; corolla-tube (in bud) about 4.5 mm. long, glabrous outside, the lobes 5; stamens 4, included, equal, not didynamous in bud; anthers oblong, about 1.3 mm. long and 0.3 mm. wide; pistil included; style stoutish, about 2.1 mm. long, glabrous; stigma very shortly 2-lobed, the lobes about 0.5 mm. long and not fimbriate; ovary oblong, about 1 mm. long and 0.8 mm. in diameter, 4-celled; fruiting-calyx and fruit not seen.

The type of this species was collected by Richard Spruce (no. 2114) near San Gabriel da Cachoeira, on the Rio Negro, Amazonas, Brazil, between January and August, 1852, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species is closely related to C. poeppigii Walp. and has hitherto been confused with C. cinereum L. The floral characters given above will probably have to be modified when specimens in full anthesis are available. Nine herbarium specimens and 10 mounted photographs have been examined. Le Cointe records the vernacular names "pào de guitarro", "pào de viola", and "pombeira".

Citations: BRAZIL: Amazonas: Spruce 2114 [Macbride photos 34318] (B--isotype, B--photo of type, Bm--isotype, Bm--isotype, Br--isotype, F--976290--photo of isotype, K--isotype, K--isotype, K--isotype, Kr--photo of type, N--type, N--photo of type, N--photo of isotype, N--photo of isotype, S--photo of type, V--285037--isotype, Z--photo of type, Z--photo of isotype).

CITHAREXYLUM AMBIGUUM Moldenke in Fedde, Repert. Sp. Nov. 37: 216. 1934.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 216. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib Avicenn. 13. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Cit. 1: 118. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 28 & 179. 1949.

Tree or shrub; branchlets medium-stout, gray, obtusely tetragonal, glabrate; nodes apparently not annulate; principal internodes 2--3.3 cm. long; leaf-scars borne on short, ascending, closely appressed, corky sterigmata; leaves decussate-opposite, often unequally paired; petioles rather stout, 0.5--1 cm. long, flattened above, glabrate; leaf-blades firmly chartaceous, gray-green on both surfaces, dull, obovate-elliptic, 5.2--16.5 cm. long, 2.5--5.7 cm. wide, rounded or subacute at the apex, entire, cuneate at the base, slightly scabrellous above, densely short-pubescent beneath, bearing a pair of elongate glands at the very base; midrib stout, deeply impressed above, prominent beneath; secondaries slender, numerous, close, 8--11 pairs, ascending at an angle of about 45°, arcuate only at their apex, rather indistinctly anastomosing at the margins, impressed above, prominulous beneath; vein and veinlet reticulation fine, impressed above, prominulous beneath; racemes terminal, erect or nutant, about 8 cm. long, about 2 cm. wide (or wider) in fruit, rather few-flowered, simple; peduncles stout, about 2.2 cm. long, gray, glabrate, with a single node near the middle; rachis stout, glabrate; pedicels obsolete, the fruits borne on greatly incrassate and gnarled sterigma-like projections; bracts, bractlets, prophylla, and flowers not seen; fruiting-calyx verylarge and incrassate, shallowly cupuliform or patelliform, about 4.5 mm. long and 10 mm. wide, very minutely puberulent on both surfaces, its rim irregularly erose; fruit extremely large, ovoid, about 1.9 cm. long and 1.6 cm. wide, fleshy, nigrescent and flattened in drying, 2-sulcate, 2-seeded, shiny.

The type of this species was collected somewhere in Mexico, the specimen being inscribed merely as follows: "Ex herb. Mus. Paris (No label). (Rec. 4/74)" and annotated first as "Cordia sp.", then "*Verbenaceae*", then "*Citharexylum*", and finally "Cf. *Citharexylum Bourgeauianum* Greenm." It has the largest fruit known to me in the genus and seems to be very closely related to *C. teclense* Standl. Only the type specimen and 4 mounted photographs have been examined.

Citations: MEXICO: State undetermined: *Ex herb. Mus. Paris s. n.* ["No label, rec'd. 4/74"] (B--photo of type, K--type, N--photo of type, S--photo of type, Z--photo of type).

CITHAREXYLUM ANDINUM Moldenke in Fedde, Repert. Sp. Nov. 37: 217-218. 1934.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 217--218. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 28. 1939; Moldenke, Lilloa 8: 414. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 40 & 88. 1942; Moldenke, Alph. List Cit. 2: 337 & 349. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 44. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 96 & 179. 1949; Moldenke, Alph. List Cit. 3: 694, 705, 706, & 968. 1949; Moldenke, Phytologia 3: 305 (1950) and 4: 187--188. 1953.

Shrub, to 1.5 m. tall; branches, branchlets, and twigs slender, often more or less flexuous or wand-like, stramineous, sharply tetragonal, glabrous, shiny, spinose, the younger ones often 4-margined, lenticellate; twigs not noticeably nor consistently abbreviated; nodes plainly annulate; principal internodes 1--5.5 cm. long; spines slender, 6--16 mm. long, with 3 sterigma-like scars in a whorl near the apex, very sharp, not very stout; leaf-scars borne on large, divergent, very corky sterigmata about 3 mm. long; leaves decussate-opposite; petioles very slender, 3--6 mm. long, glabrous; leaf-blades subchartaceous, dark-green, often subbrunneous in drying, slightly lighter beneath, oblong or elliptic, 0.8--2.8 cm. long, 5--13 mm. wide, rounded or subemarginate at the apex, entire, acute at the base, not glanduliferous, glabrate on both surfaces; midrib very slender, subimpressed above, very slightly prominulous beneath; secondaries very slender, 4 or 5 pairs, arcuate-ascending, subimpressed or obscure above, hardly prominulous beneath; vein and veinlet reticulation obscure or indiscernible on both surfaces; racemes abbreviated, to 1 cm. long, 2--4-flowered, axillary, numerous; peduncles very slender, 1--4 mm. long, glabrate; rachis obsolete; pedicels very slender, 1--3 mm. long, pulverulent or glabrate; bracts and bractlets none; prophylla minute, not obvious; calyx tubular, slightly zygomorphic, about 3.3 mm. long and 2 mm. wide, glabrate, distinctly 5-ribbed, its margin very shortly apiculate-dentate with 5-teeth; corolla white, hypocrateriform, its tube suberect, about 3.6 mm. long and 1.8 mm. wide, glabrous outside, densely tomentose in the throat within, its lobes 5, oblong-lingulate, about 2 mm. long and 1.5 mm. wide, rounded at the apex; stamens 4, subequal, inserted about 1 mm. below the mouth of the corolla-tube, included; filaments obsolete; anthers oblong, about 0.7 mm. long and 0.3 mm. wide; pistil included;

style stoutish, about 1.4 mm. long, glabrous; stigma very shortly 2-lobed; ovary oblong, about 1 mm. long and wide, glabrous; fruiting-calyx light, subherbaceous, cupuliform, about 3 mm. long and 5 mm. wide, minutely puberulent or glabrate, its rim subtruncate or shallowly 5-lobed or -angled with 5 slightly thickened ridges; fruit subglobose, about 8 mm. long and wide, fleshy, glabrous, black and wrinkled in drying, deeply 2-sulcate.

The type of this distinct species was collected by Gilbert Mandon (*no. 1493*) in thickets at Juninapi, in the vicinity of Sorata, in the valley of Challasuyo, at an altitude of 2700 meters, in the Bolivian Andes, between October, 1877, and April, 1878, and is deposited in the herbarium of the Naturhistorisches Museum at Vienna. It is closely related to *C. weberbaueri* Hayek and to *C. flexuosum* (Ruíz & Pav.) D. Don, with the former of which it has hitherto been confused. It has also been mis-identified as *Duranta plumieri* Jacq. It does not have the short twigs covered by almost overlapping sterigmata, nor the greatly abbreviated internodes, nor the pubescence of *C. weberbaueri*, from which it also differs in its stramineous, acutely tetragonal, often margined, plainly annulate branches, branchlets, and twigs, its more slender and flexuous habit, and its geographic range. It has been collected at altitudes of 2500 to 3000 meters, definitely in anthesis in November. Seventeen herbarium specimens, including the type, and 8 mounted photographs have been examined.

Citations: PERU: Cajamarca: *Scolnik 1302* (N). BOLIVIA: Cochabamba: *Steinbach 3889* [Herb. Inst. Miguel Lillo 35117] (N). La Paz: *Günther 5863* (W--1133303); *Mandon 133* (S), *1493* [Macbride photos 28393] (B--photo of type, Bm--isotype, Cb--isotype, Cb--isotype, F--830274--photo of isotype, G--isotype, K--isotype, K--photo of type, Kr--photo of isotype, L--isotype, N--isotype, N--photo of type, N--photo of isotype, P--isotype, S--isotype, S--photo of type, V--type, X--isotype, Z--photo of type), Santa Cruz: *Steinbach 8572* (E--989595, N, S).

CITHAREXYLUM ARGUTEDENTATUM Moldenke in Fedde, Repert. Sp. Nov. 37: 218. 1934.

Synonymy: *Citharexylum argentidentatum* Moldenke ex Goodspeed & Stork, Univ. Calif. Publ. Bot. 28: 117, sphalm. 1955.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 218. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 23. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34 & 88. 1942; Moldenke, Alph. List Cit. 122. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 43—44. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 71 & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Moldenke, Alph. List Cit. 3: 728 (1949) and 4: 1032, 1035, 1079, & 1211. 1949; Goodspeed & Stork, Univ. Calif. Publ. Bot. 28: 117. 1955.

Shrub, to 1 m. tall; branches and branchlets short, very twiggy, slender, tough, subterete but striate, very finely furfuraceous-puberulent with fuscous hairs, becoming glabrate in age; leaf-scars borne on incrassate sterigmata 1--2 mm. long and wider at their apex than the (dried) petiole-base; nodes very obscurely annulate; petioles 1--2 mm. long and winged by a prolongation of the leaf-blade, or obsolete; leaves decussate-opposite; leaf-blades coriaceous, lighter beneath, very shiny on both surfaces, rotund or somewhat elliptic in outline, 1.2--1.9 cm. long, 0.9--1.8 cm. wide, sharply and strongly dentate along the margins to below the middle in the manner of *Ilex opaca* Ait., with teeth very divergent, often recurved, and with slightly revolute margins, abruptly attenuate at the base and prolonged into the short winged petiole, glabrous on both surfaces, glandular-punctate beneath; midrib comparatively stout, flat above, prominent beneath; secondaries slender, 3 or 4 pairs, prominulous beneath, furcate near the margins, usually not anastomosing; veinlet reticulation sparse, obscure; racemes terminating the short branchlets, greatly abbreviated, reduced to 1, 2, or 3 flowers, when 1-flowered appearing to be axillary in the uppermost leaf-axils; flowers not seen; fruting-calyx campanulate, 3--4 mm. long and wide, glabrous, shiny, its rim rather deeply 4- or 5-toothed or -lobed; fruit subglobose or oblong, 3--4 mm. long and wide (immature?), very firm, deep-purple when fresh, black in drying, glabrous, shiny, apiculate at the apex.

The type of this apparently rare species was collected by Orator Fuller Cook and G. B. Gilbert (*no. 745*) at Ollantaytambo, altitude about 3000 meters, Cuzco, Peru, on May 15, 1915, and is deposited in the Britton Herbarium at the New York Botanical Garden. Its very thick-coriaceous, waxy-nitid, holly-like leaves characterize this species and indicate its relationship to *C. ilicifolium* H.B.K. The greatly reduced inflorescences are remarkable. It has been found on dry open hillsides in rocky soil at altitudes of 3000 to 3620 meters. It has been confused with *C. pachyphyllum* Moldenke by Killip and specimens have been distributed as "*Ilex* sp." in some herbaria. The vernacular names "tasta" and "tosta" have been recorded. It has been collected thus far only in May and it is hoped that specimens in anthesis may soon be available. Five herbarium specimens, including the type, and 5 mounted photographs have been examined.

Citations: PERU: Cuzco: *Cook & Gilbert 719* [photo 343] (W--603906), *745* (B--photo of type, K--photo of type, N--type, N--photo of type, S--photo of type, W--603930--isotype, Z--photo of type), *1865* (W--703602). Puno: *R. D. Metcalf 30464* (W--1875904).

CITHAREXYLUM BERLANDIERI B. L. Robinson, Proc. Amer. Acad. 26: 174. 1891.

Synonymy: *Citharexylum tomentosum* var. *molle* Regel ex Moldenke, Prelim. Alph. List Invalid Names 18, in syn. 1940 [not *C. molle* H.B.K., 1818, nor Salisb., 1796, nor Jacq., 1825, nor Hook., 1940]. *Citharexylon berlandieri* Rob. ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941.

Literature: B. L. Robinson, Proc., Amer. Acad. 26: 174. 1891; Coulter, Contrib. U. S. Nat. Herb. 2: 330. 1894; Grey & Hubbard, List Pl. Bot. Gard. Atkins Inst. 56. 1933; Cory, Texas Agr. Exp.

Sta. Bull. 550: 88. 1937; Moldenke, Geogr. Distrib. Avicenn. 4 & 13. 1939; Moldenke, Alph. List Common Names 22. 1939; Moldenke, Prelim. Alph. List Invalid Names 18. 1940; Moldenke, Suppl. List Invalid Names 2. 1941; Moldenke, Alph. List Invalid Names 13 & 15. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 12, 16, 71, & 88. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 73--74. 1942; Moldenke, Phytologia 2: 95 & 124 (1944) and 155. 1946; Moldenke, Alph. List Cit. 1: 32, 38, 104, 111, 114, 126, 130, 192, 199, 200, 202, 210, 299, 301, 305, 306, 309, 311, & 314. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 50. 1948; Moldenke, Wrightia 1: 244. 1948; Moldenke, Alph. List Cit. 2: 329, 332, 339, 344, 346, 349, 393, 400, 420, 422, 435, 436, 447, 491, 498--500, 502, 563, 603, 604, 607, & 639 (1948), 3: 656, 659, 678--681, 721, 764, 783--786, 792, 795, 829, 834, 879, 881--883, 906, 926, 932, & 944 (1949), and 4: 989, 1018, 1020, 1021, 1028, 1031, 1041, 1046, 1050, 1057, 1060, 1094, 1095, 1103, 1120, 1142, 1159, 1213, 1230, & 1242. 1949; W. L. Phillips, Cat. Pl. Fairchild Trop. Gard. 16 & 46. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 22, 29, 157, & 179. 1949; Menninger, Winter 1950 Seed List n.p. 1950; Moldenke, Phytologia 3: 465. 1951; Moldenke, Journ. Calif. Hort. Soc. 15: 80. 1954.

Erect shrub or small tree, 1--6 m. tall; stems to 2.5 cm. in diameter; bark pale; roots deep-seated; branches heavy, gray, subterete, glabrous, often gnarled; branchlets more slender, more or less plainly tetragonal and striate, gray or whitish, cinereous-puberulent or glabrate; nodes not annulate; principal internodes 0.3--4.5 cm. long; twigs numerous, acutely tetragonal, mostly brown and striate, decussate, densely short-pubescent or velutinous with straight, erect, brownish-cinereous hairs; leaf-scars small, sessile or borne on very much abbreviated or subobsolete sterigmata; leaves decussate-opposite, numerous on the confert twigs; petioles slender, 1--10 mm. long, short-pubescent or velutinous like the twigs; leaf-blades dark-green and subnitid above, much lighter and more grayish beneath, chartaceous, often very firm, lanceolate or oblong to elliptic (or ovate), sometimes rhomboid, 1.4--7.2 cm. long, 0.7--4.5 cm. wide, blunt or acute at the apex, rounded or acute to shortly attenuate at the base, not glanduliferous, entire or with 2 or 3 coarse and blunt lobe-like antrorse teeth near the apex, softly and shortly cano-pubescent above, especially along the midrib and larger veins (sometimes completely glabrous above except for the larger venation), densely short-villous-pubescent or velutinous beneath, especially on the venation; midrib very slender, plane or subimpressed above, merely prominulous beneath; secondaries very slender, 3 or 4 pairs, prominulous beneath (and often also above), arcuate-ascending, anastomosing at the margins; veinlet reticulation fine, usually more or less prominulous on both surfaces; racemes terminal and terminating numerous short axillary twigs, abbreviated, 1--8 cm. long, 1--2 cm. wide, densely many-flowered, the terminal one often accompanied by a pair of axillary ones from the uppermost axils; peduncles slender, 4--14 mm. long, densely short-villous-pubescent or velutinous; rachis slender, densely short-villous-pubescent or velutinous; pedicels very slender, to 1 mm. long or less, densely short-pubescent; prophylla linear, 1--3 mm. long, pubescent; flowers fragrant; calyx turbinate or campanulate, 3--4 mm. long, 2--2.5 mm. wide, striate, densely short-pubescent with spreading hairs, its rim 5-toothed, the teeth subequal, erect, very short, blunt, ciliolate; corolla white or cream-colored, its tube just equaling the calyx, pubescent within, its limb spreading, 5-lobed, about 4 mm. wide, the lobes rounded, puberulent on both surfaces; fertile stamens 4, the fifth one represented by an anantherous rudiment; filaments hairy; fruiting-calyx campanulate, 2--4 mm. long, 3--5 mm. wide, abundantly striate, densely short-villous-pubescent, its rim rather irregularly 5-lobed; fruit subglobose, reddish-green or red when fresh, dark-brown or blackening in drying, 4--5 mm. long and wide, very shiny, obtuse and often apiculate at the apex, 2-lobed, glabrous, crowded on the rachis.

The type of this very abundant species was collected by Cyrus Guernsey Pringle (no. 3222) on rocky hills at Las Canoas, San Luis Potosí, Mexico, on July 15, 1890, and is deposited in the Gray Herbarium at Harvard University. The plant is sometimes described as a tree, 10--15 feet tall, but more usually as a small shrub 3--5 feet tall. It has been found at altitudes of 8--500 meters. The young shoots are brown and densely villous-pubescent like the smaller twigs. It has been collected in anthesis from February to August, and in fruit from February to November. It has been collected along semi-desert roadsides, on flats, in thickets, on hills and rocky hills, in scrub on low ridges, in forests, in the timber belt on the leeward side of clay dunes, and in dry soil, clay soil, and black soil. White records it as "common" in Tamaulipas, while Runyon says it is "frequent but not abundant" or "widespread but not common" in Cameron County, Texas. O. M. Clark describes it as "a small tree on foothills". Vernacular names recorded for it are "fiddlewood", "negrito", and "orcujuela".

The leaves of this species vary greatly in shape. They are softly velutinous, but never harshly scabrous above as in C. scabrum Sessé & Moc. Occasionally they are subemarginate at the apex. The short densely flowered spike-like racemes, small leaves, light-colored branches and branchlets, and general grayish appearance characterize this species well. Nevertheless the Texan form has been confused with Duranta plumieri Jacq. [= D. repens L.] and with C. villosum Jacq. [=C. fruticosum var. villosum (Jacq.) O. E. Schulz], while Sessé & Mociño misidentified it as "Cytharexilum quadrangulare" [=Citharexylum affine D. Don]. It has also been confused in herbaria with C. brachyanthum (A. Gray) A. Gray, Malpighia glabra L. in the Malpighiaceae, and Sideroxylon sp. in the Sapotaceae. It is discussed as C. villosum by Coulter in Contrib. U. S. Nat. Herb. 2: 330 (1894). The fruits are erroneously described as "berries" by Leavenworth.

Edw. Palmer 40 typifies the large-leaved, long-petiolate, long-racemed form of this species, although an isotype at the

Missouri Botanical Garden has a branch of both the ordinary small-leaved form and one of the large-leaved form on the same sheet. The former is in flower, while the latter is in fruit. Liebmann 11360 is somewhat anomalous, reminding one, save for its short racemes and conspicuous pubescence, of C. affine D. Don. The three Regel collections cited below are cotypes of C. tomentosum var. molle and were collected from cultivated material in the botanical garden at Leningrad, deposited in the herbarium there. The species is also cultivated in Santa Clara, Cuba [vid., Grey & Hubbard, List of Plants Growing in the Botanical Garden of the Atkins Institution of the Arnold Arboretum at Soledad, Cienfuegos, Cuba, p. 56. 1933), at Washington, D. C. [Federal Plant Introduction 78537, in 1931], and at the Coconut Grove Plant Introduction Garden and at Chapman Field, Florida. Nealley 121 has the young leaves thin-membranous and nigrescent, the older leaves short-acuminate and serrate. The specific portion of Regel's trinomial is sometimes accredited on herbarium labels to Linnaeus, sometimes to Kunth.

In all, 229 herbarium specimens, including the types of all the names involved, and 19 mounted photographs have been examined.

Citations: TEXAS: Cameron Co.: Clover 1237 (Du--247833, Fs, Gg--233311), 1694 (Fs, Mi, N); Collector undesignated 2015 (F--955752); Cory 36624 (N, N), 51396 (N, Sm); Crockett s.n. [9-20-30] (Au); Ferris & Duncan 3051 (Ba, Du--124678, Gg--31071, N, W--1089338); G. L. Fisher 41195 (Gg, Hp); C. L. Lundell 10715 (N); Lundell & Lundell 8643 (Ld, Mi, N), 8668 (Ld, Mi, N), 10001 (Ld, N); McKelvey 1775 (A); Nealley 121 (W--60822); Owens & Parks R.1713 (Au), R.1714 (Au); R. Runyon 211 (W--1365589), 363 (Au), 486 (Rr, W--1113798), 2174 (Rr), 3838 (N, Sm), s.n. [Brownsville] (N); Schott 39 (F--42236); Shiller 659 (Au); Small & Wherry 11895 (N); Tharp 1227 (W--1116133), 1249, in part (W--1116151), 1852 (Au, N, W--1203140). Hidalgo Co.: H. B. Parks 18044 (Tr). Willacy Co.: Tharp 1249, in part (N). Green Island: Tharp 392 (Au), 1227 (N), 1249, in part (Au, Au, Au, Au, Au, Au, N). County undetermined: Hi Way Dept. 10112 [Gulf Coast of Texas] (F--841835); L. H. Pammel s.n. [S. Texas, Feb. 1929] (Io--138026). MEXICO: México: Karwinski s.n. [Toluca] (L). Oaxaca: Aguirre Benavides 27 (N), San Luis Potosí: Kenoyer A.642 (F--1003513), s.n. [Valles, 9-3-38] (Fs); W. C. Leavenworth 232 (Ld, N, Ur); Lundell & Lundell 7280 (Fs, Mh, N, N); Edw. Palmer 29 (Ca--139880, E--119124, F--176042, G, K, Mi, N, N--photo, W--470883, Z--photo), 40 (Ca--148629, E--119125, F--176054, G, K, N, W--470894), 90 (Ca--139874, Cp, E--134934, F--176423, G, K, N, N, W--470951); Pringle 3222 (A--isotype, B--isotype, B--photo of type, Bm--isotype, Br--isotype, C--isotype, Ca--104980--isotype, Cb--isotype, Cm--isotype, D--isotype, E--119122--isotype, Ed--isotype, Es--isotype, F--109548--isotype, G--type, K--isotype, K--photo of type, L--isotype, Me--isotype, Me--isotype, Mu-1736--isotype, N--photo of type, Ob--50627--isotype, P--isotype, Pa--isotype, S--isotype, S--photo of type, V--904--isotype, Vt--isotype, Vu--isotype, W--57333--isotype, W--1323183--isotype, X--isotype, Z--photo of type), 3734 (B, Bm, Br, C, Ca--169177, Cb, D, E--119123, Ed, F--220134, F--263748, G, Io--38741, J, K, L, Me, Me, Me, Mu--3841, Ob--50628, P, Pa, Pl--22588, S, V--9804, Vt, Vu, W--46918, W--1323192, X); Virlet d'Aoust 825 (P). Veracruz: Karwinski s.n. [Del Corozal] (L); Liebmann 11360 (Ca--424378, Cp, F-689262); Purpus 6140 (B, Bm, Ca--168095, Cb, E--704895, F--386651, G, N, W--464663). State undetermined: Karwinski 705 (L), 706 (L), 706b (L); Sessé, Mociño, Castillo, & Maldonado 2374 (F--849481, Q). CULTIVATED: Florida: Fennell & Jones 846 (Ar--17127); Walsingham s.n. [Chapman Field; F. P. I. 78537] (Ba). New York: Tansey s.n. [N. Y. Bot. Gard. Cult. Pl. 75022] (N). Russia: Regel s.n. [Hort. Bot. Petropol. 56.6] (B--photo, K--photo, L, N--photo, S--photo, Z--photo), s.n. [Hort. Bot. Petropol. 58.6] (L), s.n. [Hort. Bot. Petropol. 65.8] (B--photo, K--photo, L, N--photo, S--photo, Z--photo). Texas: Buckner s.n. [Genoa] (A, N, N).

CITHAREXYLUM BOURGEAUIANUM Greenm., Field Columb. Mus. Publ. Bot. 2: 185. 1907.

Literature: Greenm., Field Columb. Mus. Publ. Bot. 2: 185. 1907; Prain, Ind. Kew. Suppl. 4: 49. 1913; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Cit. 1: 53 & 302 (1946) and 2: 333, 348, & 425. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 51. 1948; Moldenke, Alph. List Cit. 3: 741 (1949) and 4: 1037 & 1057. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949.

Tall tree; branchlets medium-stout, light-colored, medullose, obtusely or acutely tetragonal, densely short-pubescent toward the apex, becoming merely puberulent or even glabrate in age, the older ones and the branches lenticellate; nodes often greatly ampliate, mostly obscurely annulate; principal internodes 0.7--5.5 cm. long; leaf-scars prominent, broad, borne on ascending sterigmata, which are often much enlarged and very corky, usually with small densely white-woolly buds in their axils; leaves decussate-opposite or the uppermost occasionally approximate; petioles slender or rather stoutish, 9--16 mm. long, canaliculate above, finely short-pubescent especially when young, becoming subglabrate; leaf-blades thin-membranous, dark-green on both surfaces, shiny above, oblong or elliptic, 6.5--15 cm. long, 2.3--7.9 cm. wide, acute or acuminate at the apex, entire, acute or acuminate at the base and slightly prolonged into the petiole, but not glanduliferous, glabrous (except for the midrib when immature) above, rather densely short-pubescent or velutinous (especially along the venation) with fuscous hairs beneath; midrib slender (or stout at the base), light in color, usually impressed above, prominent and conspicuous beneath; secondaries slender, 4--10 pairs, irregularly disposed, arcuate-ascending, often slightly impressed above, prominent beneath and plainly anastomosing near the margins; veinlet reticulation fine, prominulous beneath and often very slightly so above; racemes axillary (in the uppermost leaf-axils) and terminal, 7.5--25 cm. long, about 2 cm. wide, erect, rather loosely many-flowered; peduncles slender, very short or obsolete, densely short-pubescent; rachis slender, densely short-pubescent with fuscous hairs; pedicels slender, 1--2 mm. long, pubescent; bractlets occasionally present, lanceolate, to 1 cm. long; larger bracts usually alternate to approximate or in several pairs along that portion of the twigs between the uppermost pair of leaves and the peduncle, caducous; prophylla linear-setaceous or subulate, 1--2 mm. long, pubescent, equaling or slightly surpassing the stoutish pedicels, some recurved and more or less persistent; calyx subtubular or deeply cupuliform, about 5 mm. long, hirtellous outside, slightly puberulent within, the rim crenately 5-lobed; corolla subsalveriform, white, its tube equaling or barely surpassing the calyx, pubescent in the throat, the lobes oblong, 3 mm. long, pubescent on both surfaces; fruiting-calyx and fruit not seen.

The type of this species was collected by Eugène Bourgeau (*no. 2525*) -- in whose honor it is named -- in the region about Orizaba, Veracruz, Mexico, on June 24, 1866, and is deposited in the Gray Herbarium of Harvard University. The flowers are described as white or flesh-colored, and the plant as "un grand arbre". It inhabits humid forests, according to Botteri, and has been collected in anthesis in June and July. Its flowers remind one greatly of those of *C. chartaceum* Moldenke. It has hitherto been confused with *C. lucidum* Schlecht. & Cham. and *C. villosum* Jacq. [=*C. fruticosum* var. *villosum* (Jacq.) O. E. Schulz] and misidentified as *C. caudatum* L. and as "*Citharexylon lucidum* Cham." In all, 34 herbarium specimens, including the type, and 7 mounted photographs have been examined.

Citations: MEXICO: Veracruz: *Botteri 880* (G), *1045* (Bm, Cb, D, K, K, N, N--photo, P, P, W--771908, X, Z--photo), *1092* (A, E--921457, F--118989, F--689833, G, N, W--58034, W--1323186), *s.n.* [Orizaba] (P); *Botteri & Sumichrast 1872* (P); *Bourgeau 2525* (B--isotype, B--photo of type, Br--isotype, F--998394--isotype, G--type, K--isotype, K--photo of type, Le--isotype, N--photo of type, P--isotype, P--isotype, P--isotype, S--isotype, S--photo of type, X--isotype, Z--photo of type); *C. T. Mohr 324* (W--771909), *s.n.* [Orizaba] (D--824293).

CITHAREXYLUM BRACHYANTHUM (A. Gray) A. Gray, Syn. Pl. N. Am., ed. 2, 2 (1): 458. 1886.

Synonymy: *Lycium brachyanthum* A. Gray ex Hemsl., Biol. Cent.-Amer. Bot. 2: 426. 1882. *Lycium berlandieri* var. *normale* subvar. *brachyanthum* (A. Gray) Terrac., Malpighia 4: 520. 1891. *Citharexylum brachyanthum* (Hemsl.) A. Gray ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. *Citharexylum brachyanyhum* Gray ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941.

Citharexylon brachyanthum Gray ex Moldenke, Alph. List Invalid Names Suppl. 1: 5, in syn. 1947.

Literature: Hemsl., Biol. Cent.-Amer. Bot. 2: 426. 1882; A. Gray, Syn. Fl. N. Am., ed. 2, 2 (1): 458. 1886; Terrac., Malpighia 4: 520. 1891; Coult., Contrib. U. S. Nat. Herb. 2: 330. 1894; J. K. Small, Fl. Southeast. U. S., ed. 1, 1014 (1903) and ed. 2, 1014. 1913; C. L. Hitchc., Ann. Mo. Bot. Gard. 19: pl. 13 & 19. 1932; Cory, Texas Agr. Exp. Sta. Bull. 550: 88. 1937; Moldenke, Geogr. Distrib. Avicenn. 4 & 13. 1939; Moldenke, Prelim. Alph. List Invalid Names 16 & 32. 1940; Moldenke, Suppl. List Invalid Names 2. 1941; Worsdell, Ind. Lond. Suppl. 1: 233. 1941; Moldenke, Alph. List Invalid Names 14 & 33. 1942; Lundell, Contrib. Univ. Mich. Herb. 8: 82--83. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 12, 16, & 88. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 74--75. 1942; Moldenke, Phytologia 2: 95. 1944; Moldenke, Alph. List Cit. 1: 178, 192, 246, 302, 306, 307, 311, 313, & 314. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 5. 1947; Moldenke, Phytologia 2: 327. 1947; Moldenke, Wrightia 1: 244. 1948; Moldenke, Alph. List Cit. 2: 343, 370, 371, 393, 419, 422, 429, 437, 447, 498, 499, 593, & 615 (1948), 3: 668, 677, 683, 763, 787, 799, 829--831, 833, 834, 872, 933, & 934 (1949), and 4: 1020, 1024, 1028, 1031, 1038, 1060, 1148, 1241, & 1245. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 22, 29, & 179. 1949.

Illustrations: C. L. Hitchc., Ann. Mo. Bot. Gard. 19: pl. 13 & 19. 1932.

Loosely and intricately branched shrub, to 2.5 m. tall; branches and branchlets irregular, twiggy, rather slender, often nigrescent in drying, acutely or obtusely tetragonal (the older branches subterete), the angles margined with white or gray corky ridges, glabrous; wood yellow; twigs usually short and sharp-pointed, gray or blackish, the youngest shoots densely short-pubescent with canescent hairs; nodes not annulate; principal internodes abbreviated, 5--25 mm. long; leaf-scars small, not stalked; leaves decussate-opposite on young shoots, clustered on extremely abbreviated spur-like branchlets, which are numerous and decussate-opposite, on older wood; petioles none; leaf-blades thin-chartaceous, oblanceolate or spatulate, often curled in drying, 2--24 mm. long, 1--6 mm. wide, rounded or subacute at the apex, entire, cuneate at the base, not glanduliferous, densely canescent-pubescent on both surfaces; midrib often almost indiscernible; secondaries and veinlet-reticulation none; racemes apparently axillary, actually terminating the extremely short spur-like branchlets, reduced to 1 or 2 flowers, often borne in pairs at every node along the wood of 1, 2, or even 3 years back; bracts and bractlets none; pedicels slender, about 1 mm. long, canescent-pubescent; corolla white; fruiting-calyx patelliform or shallowly cupuliform, somewhat indurated, about 2 mm. long and 4 mm. wide, 5-toothed from a subtruncate rim, puberulent; fruit red or orange-red when ripe, white and pink when young, subglobose, shiny, about 5 mm. long and wide, glabrous, corrugated in drying, apiculate by the persistence of the style, apparently sparingly produced.

The species was based by Asa Gray on three collections of Edward Palmer as cotypes: no. 866 (the logotype), from the mountains on the west side of Saltillo, Coahuila, Mexico, collected between August 14 and 17, 1880, no. 868, from a section of low mountains with a few oaks at Soledad, 25 miles southwest from Monclova, Mexico, collected between September 9 and 19, 1880, and no. 963, from Laredo on the Rio Grande in southwestern Texas, collected in August, 1879, all deposited in the Gray Herbarium of Harvard University.

The species has been collected in anthesis from May to September, and in fruit from June to September. It has been found at altitude of 1300 to 8000 feet. It inhabits dry hills, valleys, dry valley floors, plains, low ridges, mesas, desert plains, arid limestone hillsides, crevices of limestone slopes, mountains, thin limestone soil, and barren gypsum soil, in scrub, and with Larrea and Flourensia on limestone soil. Hinton says it is frequent as scattered plants or in thinly populated colonies of small size in Coahuila. Vernacular names are "charasquillo" and "chile pájaro".

The largest leaves so far seen by me are on the sheet of Edwards 292 at Austin. In habit the species reminds one much of a Lycium or of some species of Bumelia. Most collectors describe it as a shrub 2—5 feet tall, with white flowers.

The binomial, Citharexylum brachyanthum, is occasionally erroneously accredited to "(Hemsl.) Gray". Curiously, it has been omitted from the "Index Kewensis" and all its supplements to date! C. L. Hitchcock, in connection with his splendid work on the genus Lycium (Solanaceae), which this species so closely resembles superficially, has examined a number of specimens of C. brachyanthum sent to him in error, and has annotated them in this inaccurate manner. The Mackenzie 124 and Shreve 8577, distributed as Citharexylum brachyanthum, are actually Lycium berlandieri Dunal, while Reineck s.n. [IV.1898] from Brazil, also distributed as Citharexylum brachyanthum, is the type collection of Basistemon brasiliensis Moldenke in the Scrophulariaceae. The Schott s.n. at the Chicago Natural History Museum (F--42081), determined as Citharexylum brachyanthum var. glabrum by C. L. Hitchcock, and so annotated by him, is Lycium berlandieri. It is from Eagle Pass, Texas, while Palmer 867 is a mixture of Citharexylum brachyanthum and Lycium berlandieri. These two species, in two entirely different genera and families, are astoundingly similar in general appearance!

Endlich 161 differs somewhat in its much shorter and more sparse pubescence on the leaf-blades, which, indeed, are only minutely puberulent -- a condition which, however, is approached on older portions of many specimens (e.g., Rose, Painter, & Rose 9004). The Parry 723, cited below, may be from Nuevo Leon or even from Texas; its label merely states "En route from San Luis Potosí to San Antonio, Texas". In all, 118 herbarium specimens of this species, including the type collections of all the names involved, and 10 mounted photographs have been examined.

Citations: TEXAS: Webb Co.: Edw. Palmer 963 (B--photo of cotype, G--cotype, K--cotype, K--photo of cotype, N--cotype, N--photo of cotype, Ph--cotype, S--photo of cotype, W--58032--cotype, Z--photo of cotype). Zapata Co.: Lundell & Lundell 12664 (N). MEXICO: Chihuahua: J. Gregg 570 (E--127289). Coahuila: Herb. Inst. Biol. Univ. Mex. 7161 (Me); Hinton 16525 (K), 16554 (N); I. M. Johnston 7048 (S); Edw. Palmer 866 (B--photo of cotype, D--cotype, G--cotype, K--cotype, K--photo of cotype, N--photo of cotype, S--photo of cotype, W--57334--cotype, W--1335220--cotype, Z--photo of cotype), 867, in part (C, C, F--302799, G, K, W--58035, W--1335219), 868 (D--cotype, G--cotype, K--cotype, W--58036--cotype, W--1335218--cotype); Purpus 4502 (B, Ca--143254, F--344098, G, W--841879); Shreve 8421 (Fs, Mi); Wynd & Mueller 9 (E--1113674, Fs, I, N, S, Ur, Ur). Durango: Endlich 161 (B). Hidalgo: Purpus 1837 (Ca--139878, E--119048, F--193342, G, N, W--570630); Rose, Painter, & Rose 9004 (N, W--452484). Nuevo Leon: O. M. Clark 6653 (N); M. T. Edwards 292 (Au, Du--276810, F--904024, Ok); Parry 14 1/2 (G); Pringle 11818 (B, Cp, F--179137, Fs, G, It, K, Le, Na--25816, W--461273). San Luis Potosí: C. L. Lundell 5344 (Au, Du--234991, F--754561, K, Ld, Me, Mi, N), 5356 (F--754551, Fs, Gg--233398, I, Ld, Mi, N, S); Parry 723 (G); Pringle 3749 (C, Ca-26129, Cb, Cb, D, E--127287, E--127289, F--263763, G, Gg--164090, Io--38742, J, K, Me, Me, Mu--3904, Pa, S, V--9613, Vt, W--57337). Zacatecas: Kirkwood 66 (F--245565, G); Lloyd 50 (W--574015); Pringle 7461 (F--120225, G, Mu--4150, Vt, W--305751); Shreve 8590 (Fs), 9203 (Fs, Mi). State undetermined: J. Gregg 194 (G), 494 (G), s.n. [near Audabazo] (G).

CITHAREXYLUM BRAZOSENSE Berry, U. S. Geol. Surv. Prof. Paper 92: 197, pl. 64, fig. 1 [as Citharexylon]. 1924; Moldenke, Geogr. Distrib. Avicenn. 41. 1939.

Literature: Berry, U. S. Geol. Surv. Prof. Paper 92: 197, pl. 64, fig. 1. 1924; O. M. Ball, Texas Agr. & Mech. Coll. Prof. Paper, ser. 4, 2 (5): 171, pl. 30, fig. 8. 1931; Moldenke, Geogr. Distrib. Avicenn. 41. 1939; Moldenke, Prelim. Alph. List Invalid Names 15. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 88. 1942; Moldenke, Alph. List Invalid Names 13. 1942; Moldenke in Lundell, Fl. Texas 3 (2): 75. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 42. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 166 & 179. 1949.

Illustrations: Berry, U. S. Geol. Surv. Prof. Paper 92: pl. 64, fig. 1. 1924; O. M. Ball, Texas Agr. & Mech. Coll. Prof. Paper, ser. 4, 2 (5): pl. 30, fig. 8. 1931.

Petioles short and stout, about 4 mm. long, wing-margined; leaf-blades subcoriaceous, broadly elliptic in outline, widest at the median region, about 6.5 cm. long and 3.25 cm. wide, acute or subacuminate at the apex, slightly decurrent at the base, entire; midrib stout, prominent on the under side of the leaf;

secondaries fairly stout, about 7 pairs, unequally spaced, diverging from the midrib at an angle of about 45°, upwardly curvate, camptodrome in the marginal region; tertiaries comprising pseudo-secondaries subparallel with and between some of the secondaries and numerous thin nervilles, which fork and anastomose midway between the larger veins.

The species was described from a specimen collected by O. M. Ball in the Fayette sandstone of Upper Sonoran age, by Mossy Creek, 3 miles southwest of Wellborn, Brazos County, Texas, and deposited in the United States National Museum at Washington.

CITHAREXYLUM CAUDATUM L., Sp. Pl., ed. 2, 2: 872 [as *Citharexylon*]. 1763; L., Syst. Nat., ed. 12, 416 [as "*Citharexylum caudatu*"]. 1767; L., Syst. Nat., ed. 13, 416. 1770.

Synonymy: *Berberis fructu, arbor maxima, bacc. rac.* Sloane, Cat. Pl. Ins. Jamaic. 170. 1696. *Berberis fructu arbor maxima racemosa, foliis integris, obtusis; flore albo, pentapetalo odoratissimo; fructu nigro, monopyreno* Sloane, Hist. Jamaic. 2: 99, pl. 206, figs. 3 & 4. 1725. *Citharexylon fruticosum, foliis subellipticis, petiolis pedatis, calicibus truncatis, spicis terminalibus longioribus* P. Browne, Civil & Nat. Hist Jamaic., ed. 1, 265, pl. 28, fig. 2. 1756. *Jasminum arborescens, racemosum, foliis lauri* Plum., Pl. Amer., ed. Burm., 7: 151, pl. 157, fig. 2. 1758. *Citharexylon racemis longissimis* Plum., Pl. Amer., ed. Burm., 7: 151. 1758. *Citharexylum album* Mill., Gard. Dict., ed. 8, no. 2. 1768. *Citharexylon erectum* Sw., Prodr. Veg. Ind. Occ. 91. 1788. *Citharexylum erectum* Sw. ex Jacq., Ic. Pl. Rar., ed. 2, 3: pl. 501. 1793. *Citharexylon album* Mill. ex Steud., Nom. Bot., ed. 1, 202, in syn. 1821. *Citharexylon berterii* Spreng., Syst. Veg., ed. 16, 2: 763. 1825. *Jasminum arborescens racemosum etc.* Plum. apud Walp., Repert. 4: 75, in syn. 1845. *Citharexylum berterii* Spreng. ex Schau. in A. DC., Prodr. 11: 614. 1847. *Citharexylum erectum* Jacq. apud Schau. in A. DC., Prodr. 11: 612, in syn. 1847. *Citharexylum surrectum* Griseb., Fl. Brit. West Ind. 497, in part. 1861. *Citharexylum caudatum* Seem. ex Griseb., Fl. Brit. West Ind. 497, in syn. 1861 [not *C. caudatum* Donn. Sm., 1907, nor Sw., 1847, nor Sagra, 1909]. *Citharexylum lindenii* Turcz., Bull. Soc. Nat. Mosc. 36 (3): 208. 1863. *Citharexylum caudatum* Sieb. ex Briq., Bull. Herb. Boiss. 4: 342 [as "caudato"]. 1896. *Citharexylum fruticosum, fol. subellipticis, pet. ped.* P. Browne apud O. E. Schulz in Urb., Symb. Antill. 6: 58, in syn. 1909. *Citharexylum quadrangulare* A. Rich. apud O. E. Schulz in Urb., Symb. Antill. 6: 58, in syn. 1909 [not *Citharexylon quadrangulare* Jacq., 1760, nor *Citharexylum quadrangulare* L., 1786, nor Hort. Matrit., 1845, nor Schau., 1864, nor Sessé & Moc., 1894, nor Boutelou, 1907, nor Millsp., 1907, nor Griseb., 1909, nor Jacq., 1909, nor Hort., 1911]. *Citharexylum candatum* L. ex

Roig, Est. Exp. Agron. Santiago Vegas Bol. 54: 340, sphalm. 1928. *Citharexylum berteri* Spreng. ex Roig, Est. Exp. Agron. Santiago Vegas Bol. 54:793, in syn. 1928. *Citharexylum caudatum* f. *parvifolium* Urb. ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. *Citharexylum caudatum* var. *parvifolium* O. E. Schulz ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. *Citharexylum caudatum* Cham. & Schlecht. ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. *Citharexylon emarginatum* Vahl ex Moldenke, Prelim. Alph. List Invalid Names 15, in syn. 1940. *Citharexylum emarginatum* Vahl ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940 [not *C. emarginatum* Briq., 1941]. *Citharexylum suberectum* Griseb. ex Roig, Plant. Med. Cuba 533, in syn. 1945. *Cithaexylum caudatum* L. ex Roig, Plant. Med. Cuba 778, sphalm. 1945. *Cithaexylum berterii* Spreng. ex Roig, Plant. Med. Cuba 778, in syn. 1945. *Cithaexylum lucidum* Cham. ex Roig, Plant. Med. Cuba 778, in syn. 1945. *Cithaexylum suberectum* Griseb. ex Roig, Plant. Med. Cuba 778, in syn. 1945. *Citharexylon plumerii* Plum. ex Moldenke, Alph. List Invalid Names Suppl. 1: 5, in syn. 1947 [not *Citharexylum plumieri* Otto, 1940]. *Citarexylum caudatum* L. ex Alain in León & Alain, Fl. Cuba 4: 301. 1957. *Citarexylum berterii* Spreng. ex Alain in León & Alain, Fl. Cuba 4: 301, in syn. 1957. *Citarexylum lucidum* Cham. ex Alain in León & Alain, Fl. Cuba 4: 301, in syn. 1957. *Citarexylum lindenii* Turcz. ex Alain in León & Alain, Fl. Cuba 4: 301, in syn. 1957. *Citarexylum quadrangulare* A. Rich. ex Alain in León & Alain, Fl, Cuba 4: 301, in syn. 1957. *Erythroxylon retusum* C. Wright, in herb. [not *E. retusum* Bauer, 1867, nor Baill., 1907].

Literature: Sloane, Cat. Pl. Ins. Jamaic. 170. 1696; Sloane, Hist. Jamaic. 2: 99, pl,206, figs. 3 & 4. 1725; P. Browne, Civil & Nat. Hist. Jamaic. 265, pl. 28, fig. 2. 1756; Plum., Pl. Amer., ed. Burm., 7: 151, pl. 157, fig. 2. 1758; Sandm., Fl. Jamaic. 18. 1759; L., Amoen. Acad. 5: 380. 1759; L., Sp. Pl., ed. 2, 2: 872. 1763; L., Sp. Pl., ed. 3, 2: 872. 1764; L., Syst. Nat., ed. 12, 416. 1767; Mill., Gard. Dict., ed. 8, no. 2. 1768; L., Syst. Nat., ed. 13, 416. 1770; Murr. in L., Syst. Veg., ed. 13, 472. 1774; Murr. in L., Syst. Veg., ed. 14, 564. 1784; Sw., Prodr. Veg. Ind. Occ. 91. 1788; Jacq., Coll. Bot. 3: 231. 1789; Sw., Obs. Bot. 234. 1791; Jacq., Ic. Pl. Rar., ed. 2, 3: pl. 501. 1793; Salisb., Prodr. 108. 1796; Gmel. in L., Syst. Nat., ed. 13, 2 (2): 943. 1796; Lam., Illustr. 3: pl. 545, figs. a--f. 1797; Sw., Fl. Ind. Occ. 2: 1044. 1800; Desf., Tabl. Ecol. Bot., ed. 1, 54. 1804; Pers., Syn. Pl. 2: 142. 1806; Poir., Encycl. Meth. Bot. Suppl. 2: 367. 1811; Lunan, Hort. Jamaic. 1: 292. 1814; Cels, Cat. Arbres 11. 1817; Poir. in Lam., Dict. Sci. Nat. 9: 285. 1817; Steud., Nom. Bot., ed. 1, 202. 1821; Spreng., Syst. Veg., ed. 16, 2: 763. 1825; Cham. & Schlecht., Linnaea 5: 97. 1830; Richter, Linn. Op. 603. 1835; Steud., Nom. Bot., ed.

2, 1: 375. 1840; Walp., Repert. 4: 77--78. 1845; Schau. in A. DC., Prodr. 11: 611--612 & 614. 1847; A. Rich. in Sagra, Hist. Fis. Cuba 11: 143. 1850; Griseb., Abhand. König. Gesell. Wissen. Götting. 7: 256. 1857; Griseb., Fl. Brit. West Ind. 497--498. 1861; Griseb., Pl. Wright. 2: 529. 1862; Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 208--209. 1863; Griseb., Cat. Pl. Cub. 216. 1866; Sauv., Fl. Cub. 112. 1868; Hemsl., Biol. Centr.-Amer. Bot. 2: 536. 1882; Lefroy Bull. U. S. Nat. Mus. 25: 97. 1884; Fawcett, Econom. Pl. 29. 1891; Fawcett, Prov. List Indig. Nat. Fl. Pl. Jamaic. 29. 1893; Jacks., Ind. Kew. 1: 549. 1893; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 159. 1894; Northrop, Mem. Torrey Bot. Club 12: 62. 1902; O. E. Schulz in Urb., Symb. Antill. 6: 56--59. 1909; Britton & P. Wils., Scient. Surv. Porto Rico 6: 144. 1925; León in Shelford, Nat. Guide Amer. 687. 1926; Roig y Mesa, Est. Exp. Agron. Santiago Vegas Bol. 54: 170, 198, 340, 558, & 793. 1928; Stapf, Ind. Lond. 2: 220. 1930; Standl., Field Mus. Publ. Bot. 10: 335. 1931; Grey & Hubbard, List Pl. Bot. Gard. Atkins Inst. 56. 1933; Standl., Field Mus. Publ. Bot. 18: 999. 1938; Moldenke, Alph. List Common Names 4, 9, 10, 12, 14, 17, 20, 21, 23--25, 27, & 33. 1939; Moldenke, Geogr. Distrib. Avicenn. 4--7, 10, 13, 15--17, 23, & 36. 1939; Moldenke, Suppl. List Common Names 9 & 17. 1940; Moldenke, Carnegie Inst. Wash. Publ. 522: 193--194. 1940; Moldenke, Prelim. Alph. List Invalid Names 15--17. 1940; Lundell, Contrib. Univ. Mich. Herb. 8: 60. 1942; Moldenke, Alph. List Invalid Names 13--15. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16, 19--27, 29, 34, 71, & 88. 1942; Bol. Mus. Hist. Nat. Jav. Prado 7: 245. 1943; Moldenke, Phytologia 2: 95--96. 1944; Roig y Mesa, Plant. Med. Cuba 533--534 & 778. 1945; Moldenke, Alph. List Cit. 1: 3, 7, 18, 21, 23--25, 27, 32, 39, 40, 53, 60--62, 65, 66, 72, 74, 89, 97, 118, 120, 123, 128, 130, 135, 138, 139, 147, 148, 153, 166, 170, 175, 179, 184--188, 193, 197, 198, 208, 221, 227, 231, 232, 234, 235, 247, 258--261, 267, 268, 272, 273, 283, 287, 301--303, 305, 308, 311, 312, 315--317, & 319--321. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 4 & 5. 1947; Moldenke, Castanea 13: 115. 1948; Moldenke, Alph. List Cit. 2: 328--335, 343, 346, 348--352, 393, 401, 403, 410, 419, 420, 423, 427, 428, 431, 436, 437, 446, 448, 460, 465, 469, 479, 486, 499, 501, 502, 504, 549, 569, 578, 579, 582, 583, 587, 605, 609, 614, 625, 643, & 646--652 (1948), 3: 653, 664, 675--677, 686, 706, 715, 716, 722, 740, 757, 765, 773, 775, 777, 782, 801, 802, 809, 813, 816--818, 828, 838, 842, 847, 853, 856, 866--868, 878, 886, 902, 918, 924, 928--930, 933, 934, 937, 938, 947, 948, 959--962, 969--971, & 974 (1949), and 4: 982, 983, 995, 1013, 1016, 1020, 1026, 1027, 1029--1039, 1042--1044, 1047--1049, 1051, 1052, 1054, 1055, 1057, 1061, 1065--1068, 1076, 1097, 1099, 1114, 1120, 1133, 1143--1146, 1151, 1162, 1231, 1232, 1298, & 1304. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29, 34, 36, 37, 39, 40, 42, 43, 45--47, 49, 54, 59, 71, 157, & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Moldenke, Rev. Sudam. Bot. 8: 172. 1950; Moldenke, Phytologia 3: 375. 1950; Moldenke, Phytologia 3: 451 and 4: 192. 1951; Roig y Mesa, Dicc. Bot. Cub. 260, 296, 441, 442, 477, 824, & 1003. 1953; Moldenke, Inform. Set 48 Spec. [2]. 1954; Alain in León & Alain, Fl. Cuba 4: 299 & 301. 1957.

Illustrations: Sloane, Hist. Jamaic. 2: pl. 206, figs. 3 & 4. 1725; P. Browne, Civil & Nat. Hist. Jamaic., ed. 1, pl. 28, fig. 2 (1756) and ed. 2, pl. 28. 1789; Lam., Illustr. 3: pl. 545, figs. a--f. 1797.

Openly branched but graceful shrub or small, slender, straggling, round-headed tree or treelet, to 20 m. tall, occasionally vine-like; stem to 20 cm. in diameter at breast height; bark white; branches and branchlets medium, tetragonal or subterete, often striate, glabrous, rather medullose, brownish (or the young shoots nigrescent in drying; nodes obscurely annulate; principal internodes 1--7 cm. long; leaf-scars large, borne on corky sterigmata, which on the larger branches are very large and prominent; leaves decussate-opposite; petioles slender or stoutish, 0.3--2.4 cm. long, glabrous; leaf-blades firmly chartaceous or subcoriaceous (or even coriaceous), rather dark-green and very shiny above, lighter and shiny beneath, varying from lanceolate or oblong to narrowly elliptic, 4--17.5 cm. long, 2.4--7.7 cm. wide, blunt or subacute at the apex (rarely apiculate or emarginate), entire, cuneately narrowed to the base, with the margins recurved to enclose a pair of elongate dark glands at the base, punctate beneath, very glabrous on both surfaces; midrib rather stout, prominent beneath, often prominent or prominulous above, orange-brown above and light-brown or pale greenish-white beneath and suffused below with buff when fresh; secondaries very slender, 4--7 pairs, distant, arcuate-ascending, often rather inconspicuously anastomosing near the margins, mostly prominulous beneath; veinlet reticulation delicate, sparse, often obscure; racemes axillary or terminal and terminating axillary branchlets, erect or pendent, 3--38 cm. long, 1--1.5 cm. wide, densely many-flowered, unbranched or rarely furcate; peduncles rather slender, 0.5--4.5 cm. long, glabrate; rachis slender, grass-green when fresh, glabrous or subglabrate; pedicels very slender, 1--2.5 mm. long, glabrate; bracts occasionally present, foliaceous, lanceolate, to 2.5 cm. long and 1 cm. wide, glabrous on both surfaces; prophylla setaceous, 1--2 mm. long, glabrate; flowers fragrant; calyx campanulate or cyathiform, 3--4.5 mm. long, mostly glabrate on the outside, its tube pale-green, its rim subtruncate and entire or minutely apiculate or obsoletely 5-repand-dentate, obscurely ciliate; corolla infundibular, white or cream-colored, 5-8 mm. long, its tube about twice as long as the calyx, tomentose at the apex and within, villous at the throat, its limb 5-lobed, 4--5 mm. wide, lobed 1/3 to 2/3 its length, the lobes subobovate; stamens 4; filaments about 0.5 mm. long; anthers about 1 mm. long; staminode rudimentary; pistil about 3.5 mm. long; style about 2 mm. long; stigma bilobed, broader than the style; ovary obovate; fruiting-pedicels to 3 mm. long; fruiting-calyx cupuliform or eventually patelliform, light and herbaceous or indurated, to 3 mm. long and 4 mm. wide, 5-angled, glabrous, its rim subtruncate, 5-apiculate or eventually irregularly erose and split; fruit varying from oblong or globose-oblong to obovate or subglobose, very shiny, 6--12 mm. long, 5--10 mm. wide, glabrous, from reddish-green or yellow to orange or red, turning shiny black when mature and in drying, acute-tipped; pyrenes one-celled; embryo elliptic, 4.5--6.5 mm. long, about 2.5 mm. wide and 1 mm. thick; radicle about 0.5 mm. long.

The type of this very common and distinct species was collected by Patrick Browne in Jamaica and is specimen number 5 under genus 777 in the Linnean Herbarium at London. The type of C. berterii was collected by Carlo Guiseppe Bertero (no. 169) -- in whose honor it was named -- also in Jamaica. The type of C. lindenii was collected by Jean Jules Linden (no. 1789) -- in whose honor it was named -- on Mount Liban, Oriente, Cuba, in 1843 or 1844. The type of C. album was collected from a cultivated plant in the Chelsea garden near London, England, grown from seeds sent by William Williams from Jamaica.

The species is said by collectors to inhabit open forests, especially swampy places, thickets and forests along beaches, brushy slopes, moist forests and forest borders, hammocks, hills, pastures, pinelands and pine ridges, open creek beds, the sides of railroad tracks, rocky and bracken-filled thickets, margins of woods near the seashore, mountain forests, advanced and savanna forests, oaklands, arroyos, steep slopes, low ground, limestone plains, riverbanks, the edges of pools and coastal swamps, wet forests and wooded swamps, beaches, mangrove swamps and thickets, sand-dunes near the beach, open very moist habitats, and, in general, the littoral belt. It is frequent at the edges of woods and in swampy pine forests, jungles, and the transition bush between the mangrove swamps and the pine ridge associations. It has been collected in anthesis in every month of the year, and in fruit from December to August and in October. Baker describes it as a "very openly branched but graceful shrub", whose white flowers and red "berries" (drupes) make it decidedly ornamental and worth cultivating. The fruit is described as orange by Bartlett, red by Yuncker, black by Schipp, blue by Killip, and shining scarlet by Harris. It grows from sea-level to considerable altitudes, being found at 3500 feet in Cuba, and at 4800 feet in Jamaica. Its dark branches, sparse leaf-venation, and complete lack of pubescence characterize this species well. The flowers are described as white, creamy, or yellow, and the trunk is said to attain a diameter of 5 inches or more. The immature leaves are membranous, but glabrous (not strigillose as in C. fruticosum var. brittonii, from which the color of its branches also distinguishes it). Schipp 268 has the upper leaf-surface marked with numerous elevated punctae and is described as "rare" in British Honduras. Jack 6874, 7243, 7255, and 7436 represent an especially small-leaved form with the leaf-blades regularly 1.5--6.5 cm. long and 1.1--2.2 cm. wide and with greatly abbreviated racemes. Ekman 13902, 18487, and H.1248 represent the same form, which Schulz designated as "forma parvifolia" or "var. parvifolium".

Lehmann states that the flowers are white and fragrant and the branches weak and drooping, and that the species inhabits brackish localities. The latter claim is further attested to by the fact that numerous collectors have found it in mangrove thickets. According to Roig its stems are used for wood in Cuba, and it is valuable as a honey-plant. He quotes Grosourdy to the effect that the inner bark of this and other West Indian species is considered in Puerto Rico to be a very powerful emmenogogue and abortive. A handful of the recently gathered or dried fruit is cleaned and chopped, placed into about 1.38 liters of boiling water in a vessel over live coals or hot ashes, forming an infusion that is sweetened and served in cups at the end of the day. The flowers have a very delicate odor like that of orange or lemon blossoms and are considered as a pectoral in Guadeloupe, prepared by placing a handful of the flowers in 1.38 liters of boiling water. A tea is similarly made in the treatment of diarrhoea and for afflictions of the chest. A syrup prepared with 2 parts of sugar is much stronger and is said to be a very good pectoral. An infusion prepared in the same way from the leaves, rather than from the flowers, is used in Guadeloupe to check sudden hoarseness; when drunk it produces excessive sweating.

When this species grows to become a tree, it is said to be slender and round-topped, with a dense round crown, but usually it is described by collectors as a bushy shrub or small tree. In Panama it is said to be common. Its fruit is useful as a food for birds. On some of the specimens from Mt. Diablo (*e.g.*, *Shreve s. n.* and the Perkins numbers) the leaves closely approach those of *C. fruticosum* in texture and venation and may represent a natural hybrid between the two species. *Perkins 1320* contains one leaf on the Berlin specimen, among the 15 leaves on the sheet, which resembles greatly those of *C. spinosum* L., while the remainder are those of typical *C. caudatum*. *Perkins 419* shows some *fruticosum*-like leaves, but *nos. 1098* and *1112* are typical *C. caudatum*. Sometimes, as in *Britton, Stevens, & Hess 2571* and *Stevens 4752*, the leaves are actually thick-coriaceous. In *Harris 8874* and in *Britton & Wilson 14542* only the obviously mature leaves are thick-coriaceous. Fawcett notes that the wood of this species is "a most useful timber in building, close-grained and very tough, used for mill rollers and frames, carriage wheels, &c."

Steyermark describes the leaves as firmly membranous, subcoriaceous, or coriaceous, rich-green or rich grass-green above, and pale-green or grass-green beneath. The leaves are sometimes very heavy and bright light-green, *e.g.*, *Shreve 443* from Jamaica and *Steyermark 39327* from Guatemala. *Macbride 2738* is notable in possessing a long furcate raceme. The Central American specimens have in general longer racemes and more herbaceous calyxes, which are of a lighter color in drying, as is splendidly exemplified by *Gentle 61* and *Macbride 2738*. In Central America the species seems to be especially fond of the seashore as a habitat. *Fendler 290* represents an especially broad-leaved form, whose leaf-blades are regularly 5.2--6.9 cm. wide and are mostly emarginate at the apex, while in Harris 9825 they attain a length of 17.5 cm. and a width of 7.7 cm. and the petioles are to 2.4 cm. long. Ordinarily the petioles are only about 1 cm. long. Occasionally, as in Leonard 4317, 4372, and 4536, the midrib and secondaries and even some of the veinlets are deeply impressed above. The flowers are almost uniformly described as fragrant, except by Cooper, who states flatly that they have "no odor". The species has been widely confused with C. lucidum Cham. & Schlecht. and C. villosum Jacq. [=C. fruticosum var. villosum (Jacq.) O. E. Schulz]. Schulz includes "C. lucidum Cham." and C. chamissonis Walp. in the synonymy of C. caudatum; Fawcett and Roig also include C. lucidum. The latter, however, is a distinct Mexican species.

The corolla-lobes are usually reflexed when the plant is in full anthesis. The species is known to be cultivated in Panama, Cuba, Peru, Chile, and the Hawaiian Islands. According to Grey & Hubbard, List Pl. Bot. Gard. Atkins Instit. 56 (1933), it is cultivated at Cienfuegos, Las Villas, Cuba. It was collected by J. G. Jack at Buenos Aires, Cuba, in April, 1929. Raimondi says of his no. 12203 "Jardin botanico de Lima. Se cree indigena de Chanchamayo, Dep. Junín". His no. 12507 was collected at Pampa hermosa, Montaña de Pangoa, Junín, and may be the source collection for the seeds from which the cultivated Lima material was raised. This is a remarkable range extension for the species, if it is truly native in Junín and if the Peruvian plant is really C. caudatum. There is, however, doubt in my mind concerning both of these assertions. It was originally determined as "Loganiaceae?" The Peruvian specimen in the J. Jussieu herbarium was originally determined as "Citharexylon emarginatum Vahl" and as "Citharexylum emarginatum Vahl". A sheet of Sintenis 1370 at Leningrad has on it a specimen of Ocotea leucoxylon (Sw.) Mez, of the Lauraceae, instead of Citharexylum caudatum, and doubtless represents a case of transposed labels. Harris 9378 was originally misidentified as "Anona cherimolia Mill." The Herb. Osbeck s.n. at Stockholm, determined as Citharexylum caudatum, is a species of Inga, in the Mimosaceae. Andersson s.n. from Guam was originally misidentified as Gmelina asiatica L. and G. inermis Blanco. The Munich specimens of Sintenis 5351 are labeled "535" -- the last figure apparently having been omitted when the labels were made.

The illustrations in Plum., Pl. Amer., ed. Burm., pl. 157, fig. 2 (1758), labeled "C. caudatum", and in Jacq., Ic. Pl. Rar., ed. 2, 3: 501 (1793), as "C. erectum", actually are C. fruticosum L. Buch 1449 is a monstrosity (nos. 2, 3, and 4), with the calyx deeply split, the 4 lobes often unequal, the corolla slightly exceeding the calyx, the anthers 1.8 mm. long and substerile, and the pedicels elongate, 5--10 mm. long. The plant cultivated in Cuba and collected as C. F. Baker 23 was grown there from seeds sent from Belize, British Honduras. Baker says that the shrub has decidedly ornamental "spikes" [racemes].

Vernacular and common names recorded for the species are "bird-seed", "bois carré", "bois guitarre", "canilla de venado", "cateicillo", "cigua", "citharexylum a fleurs en queue", "coffé marron", "collarete", "collarette", "dama", "fiddle wood", "fiddle-wood", "fidelle-wood", "guairo sando de costa", "guairo santo", "guairo santo de costa", "guayo blanco", "higuerillo", "juniper berry", "juniper-berry", "long-spiked fiddle-wood", "manglillo", "moco de pavo", "palo de dama", "palo de guitarra", "palo de guitarre", "palo guitarre", "penda", "pendola de sierra", "pénlula blanca", "perda", "pigeon-feed", "roble amauce", "roble amarillo", "roble blanco", "sauge doncella", "white fiddlewood", "white fiddle-wood", and "wild-cherry". Some of these names are also applied to other species; for instance, "canilla de venado", "guairo sando de costa", and "roble amarillo" apply also to *C. fruticosum*, "juniper-berry" and "white fiddle-wood" to *C. spinosum*, "fiddle-wood" to *C. spinosum* and to *Petitia domingensis* Jacq., "higuerillo" to *C. fruticosum* and to *Vitex divaricata* Sw., "penda" to *C. fruticosum*, *C. fruticosum* var. *subvillosum* Moldenke, *C. fruticosum* var. *villosum* (Jacq.) O. E. Schulz, *C. spinosum*, and *Cornutia pyramidata* L., and "white fiddlewood" to *C. fruticosum*, *C. fruticosum* var. *brittonii* Moldenke, *C. fruticosum* var. *villosum*, *Vitex capitata* Vahl, and *Vitex compressa* Turcz. "Moco de pavo" is applied also to *Amaranthus cruentus* L., in the *Amaranthaceae*, "guairo santo" to *C. fruticosum* and to *Aegiphila elata* Sw., "guayo blanco" to *C. fruticosum*, *C. tristachyum* Turcz., *C. spinosum*, and *Banara roigii* P. Wils. (*Flacourtiaceae*), "cateicillo" to *Phyllanthus nobilis* (L. f.) Muell.-Arg. (*Euphorbiaceae*), "bois carré" to *C. spinosum*, and "roble blanco" to *C. fruticosum* and *Tabebuia angustata* Britton (*Bignoniaceae*). Jäger records the name "caffé marron" from Haiti and was misled by this name into thinking that our plant is a species of *Coffea* (*Rubiaceae*).

Schulz's key to distinguish *C. caudatum* from the other West Indian species of the genus is worth repeating here:

1. Corolla 2--3 times as long as the calyx.
  2. Leaf-blades widely reticulate-veined, very smooth; pedicels 2 mm. long during anthesis; pyremes 1-celled....*C. caudatum*.
  2a. Leaf-blades closely reticulate-veined, often pilose; pedicels 0.5—1.5 mm. long during anthesis; pyrenes 2-celled.
    3. Pedicels 0.5—0.75 mm. long during anthesis.
      4. Leaves small, 7--12 mm. long; racemes very short, about 6 mm. long...........................*C. microphyllum*.
      4a. Leaves larger, 3.5—14.5 cm. long; racemes much longer.
        5. Leaf-blades oblanceolate, long-acuminate at the base; lateral veins prominulent beneath........C. bahamense.
        5a. Leaf-blades more or less elliptic, short-acuminate at the base; lateral veins distinctly prominent beneath.
          6. Lateral veins prominent only beneath; calyx plainly dentate; branchlets obtusely tetragonal.*C. albicaule*

6a. Lateral veins prominent on both surfaces; calyx
very shortly dentate; branchlets sharply tetragonal...............................*C. fruticosum.*
3a. Pedicels 1--1.5 mm. long during anthesis.
7. Corolla glabrous outside; calyx attenuate to the base.
8. Leaf-blades very densely reticulate-nervose..........
C. spinosum.
8a. Leaf-blades widely reticulate.
9. Leaf-blades barbulate in the vein-axils beneath;
corolla split to 1/3 its length......*C. tristachyum.*
9a. Leaf-blades tomentose throughout beneath; corolla
split to 1/5 its length................*C. urbanii.*
7a. Corolla tomentose outside; calyx rounded at the base...
C. pentandrum.
1a. Corolla 3 1/2 to 5 times as long as the calyx.
10. Calyx-rim truncate, merely tuberculate-apiculate by the
prolongation of the ribs of the calyx-tube; corolla 3 1/2
times as long as the calyx...................*C. discolor.*
10a. Calyx-rim very shortly 5-dentate; corolla 4 or 5 times as
long as the calyx.........................*C. longiflorum.*

Actually, I regard *C. bahamense* as a mere form of *C. fruticosum* var. *villosum* and *C. urbanii* as a form of *C. tristachyum*. There seem to be too many intermediate specimens to justify the separation of these two forms nomenclaturally. The *Perkins 419* and *1320*, distributed as *C. caudatum*, appear to represent natural hybrids -- the former with *C. fruticosum* and the latter with *C. spinosum*, hereinafter cited under x*C. jamaicense* Moldenke and x*C. perkinsi* Moldenke respectively.

In all, 656 herbarium specimens, including the type and the type collections of all the synonyms, and 24 mounted photographs have been examined.

Citations: MEXICO: Chiapas: *Matuda 3771* (F--1028096, Mh, N), *3776* (F--1028092, Mh, N). Tabasco: *Matuda 3066* (F--1026500, Me, Mh, N). Veracruz: *Botteri s.n.* [Orizaba] (G, W--771909, in part). GUATEMALA: Izabal: *C. C. Deam 64* (G), *69* (G); *Kellerman 4755* (W-575427); *P. C. Standley 72151* (F--991244, N), *73112* (F--990833); *Steyermark 38920* (F--1059814), *39364* (F--1051021), *39827* (F--1060103). BRITISH HONDURAS: *H. H. Bartlett 11220* (Mi), *11337* (F-662516, F--662517, K, Mi, Mi, Mi, Mi, Mi, N, W--1587509), *11796a* (Mi); *Gentle 1* (F--665455, Mi), *61* (F--663960, I, Mi, N, S), *2268* (Dp--28975, F--944998, Mh, Mi, N), *2741* (Mh, Mi, Mi, N); *Johnson s.n.* [Belize] (W--429966); *Kinloch 196* (F--675914); *C. L. Lundell 1873* (Au, F--685348, Me, Mi, Mi), *4214* (Mi, N), *4215* (F--689430, Me, Mi, S), *6690* (Au, F--894318, Mi, Mi, N); *O'Neill 8736* (I, Mi); *Peck 102* (G); *Record 14* (F--659152); *Schipp 268* (A, B, Bm, Ca--396490, Cb, Cb, E--988625, F--713229, G, J, K, Mi, N, S, W--1494697); *J. D. Smith 41* (W--57331, W--1323188), *s. n.* [Belize, 1889] (F--577224). HONDURAS: Atlantida: *Mitchell 9*

(F--580541, G); P. C. Standley 53052 (A, F--582278, N--photo, W--1407482, Z--photo), 54230 (A, F--584127, W--1408184), 56873 (A. F--581960, W--1409447); Yuncker 4656 (Dp, E--1086845, F--749638, Mi). Cortés: Hjalmarsson 39 (S). BAY ISLANDS: G. F. Gaumer 141 (K). COSTA RICA: Alajuela: Standley & Torres 47875 (W--1305322). Cartago: Standley & Torres 50995 (W--1306572). Limón: H. Pittier 3642 (N, W--678700); E. Wall s.n. [Port Limón, 16/2/27] (Ew). PANAMA: Bocas del Toro: G. P. Cooper 561 (F--579645, S, W--1491507, Y--12194); Cooper & Slater 139 (F--572712, W--1316770, Y--10485); Hart C^{2}.117 (K); Wedel 2469 (N), 2812 (N). Canal Zone: P. H. Allen 1836 (F--1004884); Bailey & Bailey 682 (Ba, F--703180); Celestine 73 (W--716330); Cowell 195 (N); Epplesheimer s.n. (F--285368); Fendler 290 (E--119049, E--119050, G, K, N--photo, W--57338, Z--photo), 290b (G, K, K, W--57339); J. W. Gillespie P.8 (Du--159024, S), s.n. [Feb. 19, 1926] (Du--159031); Hayes 568 (Bm, K); Hunter & Allen 705 (E--1121312), 720 (E--1121310); Killip 12105 (W--1167240); Lehmann K.287 (K); Macbride 2738 (F--521254, W--1167983); Maxon 6775 (N, W--1180508); Paul 389 (N); Piper 5361 (N, W--1167564), 5562 (W--1166115); H. Pittier 2631 (Bm, F--575525, G, N, W--676780); Rowlee & Rowlee 397 (W--1036453); Seemann 522 (Bm); P. C. Standley 25178 (A, W--216327), 26394 (A, W--1216980), 31195 (W--1219716); F. L. Stevens 171 (Ur), 979 (Ur), 1039 (Ur); Gene White 161 (F--1004847), 163 (F--1004849); P. White 102 (F--1004865). Cocle: R. S. Williams 373 (N, W--678085). Colón: P. H. Allen 3597 (N, N, S); Debeaux 45 (V), 51 (P, P); Hayes 714 (T), 889 (T); Kuntze 1820 (N); H. Pittier 3942 (G, N, W--679024); P. C. Standley 30163 (W--1219113). Panamá: N. J. Andersson s.n. [Apr. 1852] (S); Gervais 151 (W--716542); J. F. Macbride 2738 (N); P. C. Standley 25916 (W--1216723), 27742 (W--1217743), 28171 (W--1217993), 29754 (N--photo, W--1218882, Z--photo), 29781 (W--1218903), 31882 (W--1225038). Province undetermined: Duchassaing s.n. [1850] (L), s.n. [1851] (P); Dunlap 528 (F--689801, W--1405720); Maurice 885 [Boqueté] (W--1791135); Piper 5333 (W--1165956); Seemann 522 (K). PEARL ISLANDS: San José Island: C. O. Erlanson 23 (N). BAHAMAS: Northrop & Northrop 571 (A, B, C, F--130666, G, K, X). CUBA: Havana: C. F. Baker 28 (Cb); Baker & Abarca 4322 (A, B, E--119111, Es, N, Po--64672, W--523745); Cremata 7504 (Es); Ekman 18317 (N, S); Fortún 6946 (Es); O'Donovan 5204, in part (Po--63512); Roig 1281 (Es), 3585 (Es), 3730 (Es), 6323 (Es); Serre s.n. [1909] (Bg); Shafer 472 (Cm, Es, N). Las Villas: Alain 6465 (Z); C. F. Baker 2508 (B, Es, N, Po--63515), 4979 (B, Ca--139935, Es, N, Po--63517); Britton & Wilson 5454 (N); Ekman 13902 (B, S), 18487 (B, S); R. A. Howard 5204 (N), 5228 (N, N); J. G. Jack 6874 (A, N, N), 7243 (A, B, Ba, F--702521, N, W--1478175), 7255 (A, N, N, N--photo, P, W--1476546, Z--photo), 7346 (D--777439), 7436 (A, A, N, N, S, W--1478085, W--1556130); León 6675 (Ha, N), 6705 (Ha, N), 13954 (Ha, N); León & Clément 6507 (N), 6587 (N), 6705 (Ha, N); Luna 32 (N). Matanzas: Comas s. n. [Herb. Roig 3612] (Es). Oriente: Acuña 10206 (Es); Alain 252 (Ha); Clément palo 36 (Sc); Edmund 68 (Ha); Ekman 1616 (N, S), 6032 (B, S), 6726 (S), 9800 (S), 13826 (S), 14238 (S), 17750 (S); León 9942 (Ha, N), 10909 (Ha, N); León, Clément, & Roca 9942 (N); Linden 1789 (B, Bm, Bm, Br, Cb, Cb, Cb, F--686810, K, N, N--photo, P, S--photo, V--285072, X, Z--photo); Underwood & Earle 712 (N); C. Wright 435 [1856--7] (B, D--611743, G, K, X), 435 [1859, 1860] (E--119083), 436 [1856--7] (D--611743, G, N, X), 436 [Jan.--Jul. 1859] (G), 436 [1860] (K, L, Os, P, S), 436 [Herb. Sauvalle 1768] (Hv, Hv, Hv), 1359 (Br, Cb, Cb, E--119082, G, K, L, N, N, Os, P, S, V--211827, X). Pinar del Río: Alain 149 (Hk), 492 (Z); L. H. Bailey 12160 (Ba); Britton & Britton 7533 (F--285621, N, W--696844); Britton, Earle, & Gager 6732 (N); Earle 747 (F--285878, N); Ekman 13826 (N); Ganganélli s.n. [Herb. Roig 2063] (Es); León 5153 (N), 12622 (Ha, N), 13843 (Ha, N); León, Victorin, & Alain 19662 (Ha, N); Moldenke & Moldenke 19871 (Es, Lg, Mg, N, Ot, Sm); O'Donovan 5204, in part (B, N); Roig 1087 (Es); Rutten-Pekelharing 468 (Ut), 474 (Ut); Shafer 380 (N), 11771 (N, W--699437). Province undetermined: Herb. Sauvalle s.n. (Hv); C. Wright 116 [Herb. Sauvalle 1766, in part] (Hv), 1356 [no data] (B, Pa, T, W--57323), 1356 [Herb. Sauvalle 1770] (Hv), 3183 [Herb. Sauvalle 1769, in part] (B, B, E--119071, G, Hv, N, N, Os, Pa, S, S, W--57324, W--57325). ISLA DE PINOS: Britton & Wilson 14542 (Cm, F--459762, N, W--793445), 14856 (N); Cremata s.n. [Herb. Roig 2022] (Es); Curtiss 515 (A, B, Bm, Cb, Cm, E--119072, Ed, Ed, Es, F--165422, G, It, K, L, Le, Mu--3993, N, P, Vt, W--522132), s.n. [Nueva Girena] (N); Ekman 12120 (S); O. E. Jennings 167 (Cm, N); Killip 42904 (Le), 43872 (N); León 17880 (Ha, N). JAMAICA: R. C. Alexander s.n. [1850] (A, D--612059, K, Ol), s.n. [Herb. Griseb.] (B), s.n. [Moneague] (K, N, W--1048203); Balbis s.n. (B); Bertero 169 (B, E--photo, N--photo, S--photo, W--photo, Z--photo), s.n. (Dc); N. L. Britton 106 (N, N), 490 (N), 1553 (N); Browne s.n. [Herb. Linnaeus G.777, S.5] (N--photo of type, S--photo of type, Z--photo of type); Campbell 5722 (B); Crawford 693 (D--539327, N); Fawcett 6783 (F--145925); W. Harris 6783 (N), 8546 (A, B, B, Bm, Ca--522699, N), 8677 (B, Bm, D--524400, F--174302, Le, N, W--655745), 8874 (B, Bm, Bm, N), 9378 (B, Bm, F--212295, N, W--524698), 9825 (B, Bm, F--250368, G, K, N, P, W--848513), 11065 (Bm, N, W--699857); Harris & Lawrence C.15127 (J), C.15409 (N, W--794095), C.15410 (Ur), C.15508a (A); Hart 577 (W--1323225); Jenman s.n. [Bot. Garden] (Ca--323441); March 1447 (K), 1780 (K), s.n. [Jam.] (G, L); Maxon 8657 (S, W--1182242);

Maxon & Killip 1369 (A, Bm, F--500842, G, K, Os, P, Ur, W--1046477); McNab 35 (Ed), s.n. (B, Ed); Perkins 1098 (B), 1112 (B); Rehder s.n. [Blue Mtns.] (A, A, A); Shreve 443 (Fs), 444 (Fs), 532 (Fs), s.n. [Mt. Diablo] (N), s.n. [near Cinchona] (N, N); Swartz s.n. (Bm); W. T. Thompson 6783 (B); Tussac s.n. (Dc); W. Wright s.n. [1778] (S), s.n. (Bm); Wullschlägel 973 (Mu--747). HISPANIOLA: Haiti: W. Buch 500 (B), 1449 (B), 1626 (B); Ekman H.1248 (B, S, W--1410257); Jäger 44 (B, L); E. C. Leonard 4314 (Bm), 4317 (F--505921, G, W--1076774), 4372 (N, W--1076838), 4536 (B, N, W--1077027), 9148 (E--939433, F--574251, N, W--1300400), 9546 (Ca--318037, G, W--1300651); Picarda 1515 (B, S). Dominican Republic: Nectoux s.n. [St. Dominique] (Ed, P); Prenleloup 431 (B); L. C. Richard s.n. [S. D.] (P). PUERTO RICO: Britton, Britton, & Brown 6565 (Cb, N); Britton & Hess 2275 (F--414974, G, Gg-31072, N, S, W--759898); Britton, Metz, & Chardon 6887 (N, W--1145460); Britton, Stevens, & Hess 2571 (E--718783, F--414595, N, W--758875); Eggers 5351 (Cp, E--119098, N); I. E. Gregory 76 (N); Kramer 33 (Y--1345); Otero 729 (Bt--58765, N, N); Shafer 3379 (F-451647, N, W--792468); Sintenis 1287 (B, Bm, G, K, Lu, V--144, W-403462), 1370 (B, Cb, Le), 1386 (B, Bm, G, K, L, Lu, V--143, W--403461), 2889 (B, S), 5351 (B, Cb, F--80073, K, Lu, Mu--3760, Mu, P, X); F. L. Stevens 4752 (N), 8433 (N); Stevens & Hess 2275 (N). MARTINIQUE: Collector undesignated s.n. (V--220004). WEST INDIES: Island undesignated: Herb. Jacquin f. s.n. (V); Riédlé s.n. (P); Swartz s.n. [Ind. occid.] (S). COLOMBIA: Antioquia: Haught 4889 (N). PERU: Junín: Raimondi 12507 (B, N--photo, Z--photo). Department undetermined: Herb. J. Jussieu s.n. [Herb. A. L. Jussieu 5087] (P). MARIANNA ISLANDS: Guam: N. J. Andersson s.n. (S). CULTIVATEDL Cuba: C. F. Baker 23 (A, Bl--42208, Bz--18722, Ca--123973, E--119068, Ed, Ed, Es, G, G, Io--45339, K, K, L, L, Ms, N, N--photo, Po--253380, Po--253381, W--618081, X, Z--photo); Moldenke & Moldenke 19892 (Es, Lg, N, Sm). Panama: Crawford 397 (D--539015, N); H. N. Moldenke 19801 (N). Peru: Raimondi 11906 (B), 12203 (B). Chile: Cuming 287 (V). Hawaiian Islands: Degener & Murashige 20075 (N).

CITHAREXYLUM CHARTACEUM Moldenke in Fedde, Repert. Sp. Nov. 37: 219. 1934.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 219. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 22, 23, & 36. 1939; Moldenke, Brief Course Syst. Bot., ed. 2, 20. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 33, 34, 71, & 88. 1942; Moldenke, Alph. List Cit. 1: 180, 276, 303, & 319. 1946; Moldenke, Brief Course Syst. Bot. Gard. 21. 1947; Moldenke, Alph. List Cit. 2: 420 & 436 (1948) and 4: 1057, 1067, & 1113. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 69, 71, 157, & 179. 1949.

Shrub or tree, to 8 m. tall; branchlets rather slender, gray, acutely tetragonal, glabrate, with the angles margined; twigs and younf shoots brown, acutely tetragonal and margined, glabrous; nodes obscurely or not at all annulate; principal internodes 1--5 cm. long; leaf-scars relatively small and inconspicuous except at the apex of the branchlets, where they subtend twigs or young shoots and where they are borne on large, stout, corky sterigmata to 4 mm. long and wide; leaves decussate-opposite; petioles very slender, 2--13 mm. long, glabrous; leaf-blades membranous or thin-chartaceous, dark-green and shiny above, lighter beneath, oblong-elliptic or broadly elliptic to subobovate (the smaller ones often subrotund), 5--15.5 cm. long, 3.2--7.2 cm. wide, acute or short-acuminate (rarely emarginate) at the apex, entire, acute or cuneate at the base, bearing 1 or 2 very small and usually inconspicuous disk-like glands on the blade near its base or not glanduliferous, glabrous above, finely puberulent beneath, becoming completely glabrous in age; midrib very slender, plane or very slightly impressed above, prominulous or almost plane beneath; secondaries very slender, 5--8 pairs, arcuate-ascending, anastomosing near the margins in many arches or not anastomosing, prominulous or plane beneath; veinlet reticulation very abundant, extremely fine and delicate, conspicuous but not at all prominulous beneath; racemes terminal and terminating axillary twigs, erect or pendent, mostly nutant, 9.5--18 cm. long, about 1.5 cm. wide, rather loosely many-flowered; peduncles very slender, 1.5--3 cm. long, glabrate or very obscurely puberulent; rachis very slender, glabrate or obscurely puberulent; bractlets often 1 pair at the base or middle of the peduncle, linear, to 4 mm. long; prophylla setaceous, about 1 mm. long, obscure; pedicels to 1 mm. long or obsolete; calyx campanulate, light-textured and translucent, about 3.1 mm. long and 2.8 mm. wide, slightly venose, glabrous, its rim shortly 5-toothed, the teeth very short; corolla hypocrateriform, its tube about 4.4 mm. long, about 1.8 mm. wide at the base, ampliate to 3.3 mm. at the apex, glabrous outside, densely long-pilose in the throat within, its limb 5-lobed, the lobes oblong-obovate, about 3.2 mm. long and 2.3 mm. wide, rounded at the apex, pubescent on the miier surface; fertile stamens 4, equal, included, inserted about 2 mm. below the mouth of the corolla-tube; filaments about 0.7 mm. long; anthers ovate, about 1 mm. long and 0.5 mm. wide at the base; staminode small, filiform, about 0.2 mm. long; pistil included; style about 1.5 mm. long, glabrous; stigma ampliate, about 0.5 mm. wide, very shortly 2-lobed; ovary subglobose, about 0.8 mm. long and wide, glabrous; fruiting-calyx and fruit not known.

The type of this species was collected by August Weberbauer (no. 7633) in deciduous bushwood in the mountains east of Hacienda Chicama, province of Tumbes, Tumbes, Peru, between February 19 and 24, 1927, at an altitude of 1000 meters, and is deposited in the herbarium of the Chicago Museum of Natural History. The collector describes the flowers as brownish-yellow or yellowish-white and the filaments as white. It has also been collected in anthesis in January. The species has hitherto been confused with *C. molle* H.B.K. and *C. quitense* Spreng. Its extremely thin leaf-blades, their very delicate but conspicuous and yet not in the least elevated venation on the lower leaf-surface, and the woolly corolla-throat characterize it well. In some of these respects it reminds one of *C. discolor* Turcz.

The Herb. Bernhardi specimen at St. Louis is placed here tentatively. It is taken from a cultivated plant and disagrees somewhat from the ordinary characters of the species, which character combination is remarkably constant in all the other specimens cited and renders the species most easy to identify. The Bernhardi specimen has more conspicuously pubescent or strigillose lower leaf-surfaces and puberulent petioles and young shoots.

Thirty-two herbarium specimens, including the type, and 7 mounted photographs have been examined.

Citations: ECUADOR: Manabi: *Eggers 15562* (B, Bm, Cp, F--143454, K, K, L, Le, Lu, Mu--1845, N, N, N--photo, P, S, W--1323220, Z--photo). PERU: Tumbes: *Weberbauer 7633* (B--isotype, B--isotype, B--photo of type, Cb--isotype, F--571766--type, G--isotype, K--isotype, K--photo of type, N--isotype, N--photo of type, S--isotype, S--photo of type, W--1495252--isotype, Z--photo of type), *7678* (B, Cb, F--571821, G, K, S, W--1495253). CULTIVATED: Locality undetermined: *Herb. Bernhardi s.n.* (E--119093).

CITHAREXYLUM COOPERI Standl., Trop. Woods 10: 50. 1927.

Literature: Standl., Trop. Woods 10: 50. 1927; Hill, Ind. Kew. Suppl. 8: 53. 1933; Standl., Field Mus. Publ. Bot. 18: 1000. 1938; Moldenke, Alph. List Common Names 9 & 33. 1939; Moldenke, Geogr. Distrib. Avicenn. 17. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 22, 23, & 88. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 123, 170, 319, & 320. 1946; Moldenke, Phytologia 2: 331. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 54. 1948; Moldenke, Alph. List Cit. 2: 333, 347, & 390 (1948), 3: 757, 821, 940, & 978 (1949), and 4: 1031, 1045, 1048, 1053, 1055, 1067, 1072, & 1186. 1949; Moldenke, Phytologia 3: 133. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 39, 40, & 179. 1949.

Shrub or small tree, to 8 m. tall, with spreading crown; stem to 15 cm. in diameter; branchlets and twigs rather slender, acutely tetragonal, the young shoots light-brown, often 4-margined and more or less deeply sulcate on two opposite sides, medullose, short-pilose at first with spreading hairs, later glabrate; nodes not annulate; principal internodes 2.5--9.5 cm. long; leaf-scars borne on conspicuous, stout, and corky sterigmata; leaves decussate-opposite; petioles rather stoutish, 2--15 mm. long, deeply canaliculate above, minutely puberulent or glabrate; leaf-blades subcoriaceous (chartaceous or membranous when immature), pale, gray-green and shiny above, usually brighter green beneath, ovate or oblong to elliptic or oblong-elliptic, occasionally subovoid, 4,8--20 cm. long, 2.3--8 cm. wide, acute or short-acuminate at the apex, entire, acute or short-cuneate and decurrent at the base, bearing a pair of very small discoid glands on the blade at the base (plainly visible on immature leaves, obscure on or absent from mature leaves), glabrous or subglabrous above, pubescent or densely velutinous-pilose along the midrib and larger venation and minutely puberulous on the lamina beneath; midrib rather stout, deeply impressed above (on mature leaves), very prominent beneath; secondaries stoutish, 5--7 pairs and arcuate-ascending, usually not anastomosing, deeply impressed above (on mature leaves), very prominent beneath; veinlet-reticulation sparse, more or less impressed or obscure above, prominulous beneath; racemes numerous, erect, paniculate, terminal and terminating short axillary twigs, 2--9 cm. long, often bearing 1 or 2 pairs of branches in the axils of the branchlets at the base, each branch 1--1.5 cm. (or less) wide, densely many-flowered; peduncles slender, 1.5--3.5 cm. long, short-pubescent or puberulent with canescent hairs or subglabrous, usually bearing 1--5 nodes at each of which is borne a pair of linear bractlets; rachis similar to the peduncle, mostly short-pilose; pedicels filiform, 1.2 --2 mm. long or less, pubescent or puberulent; bractlets linear, paired, to 5 mm. long, short-pubescent or puberulent; prophylla setaceous, to 1 mm. long; flowers fragrant; calyx narrowly campanulate, about 4 mm. long, sparsely hirtellous; corolla white, its tube about 2.5 mm. long, the lobes about 2 mm. long, obtuse at the apex, minutely puberulent; fruiting-calyx much indurated and incrassate, about 4 mm. long and 6.5 mm. wide, deeply 5-lobed, prominently striate, the lobes triangular, acute at the apex, 2.5—3 mm. long, to 3 mm. wide at the base; fruit orange, globose, about 8 mm. long.

The type of this species was collected by George Proctor Cooper -- in whose honor it is named — and G. M. Slater (no. 34) in the Changuinola Valley, Bocas del Toro, Panama, in 1927, and is deposited in the United States National Herbarium at Washington. Cooper describes it as a tree 25 feet tall, with a trunk 6 inches in diameter, and with "a full spreading crown". He also describes the flowers as white and pleasantly odorous, and records the common names "corrimiente" and "wild-lime". The former of these names is also applied to C. viride Moldenke. In it Panamanian habitat, he says, it is a small shrubby tree of no commercial importance, but "the hard dense wood seems to have possibilities for turnery and it is knwon to be durable and very strong."

The species is well marked by its regularly impressed midrib and secondaries on the upper surface of the mature leaves, its subcoriaceous grayish-green leaf-blades, and its usually compound racemes. It is said to inhabit plains, clearings, and cacao orchards, ascending to 640 meters altitude. It has been collected in anthesis from January to March and in June, and in fruit in August. In herbaria it has been confused with C. integerrimum (Kuntze) Moldenke. Thirty-three herbarium specimens, including the type, and 9 mounted photographs have been examined.

Citations: COSTA RICA: Guanacaste: Brenes 12322 [211] (N). San José: Skutch 4315 (F—973965, N, S, W—1644953). Province undetermined: H. Pittier s.n. [Herb. Instit. Physico-geogr. Nat. Costaric. 16071] (B, B, B, B, B, W--578476, W--1080205). PANAMA: Bocas del Toro: G. P. Cooper 384 (F--579254, F--579523, K, N, N, N, N--photo, W--1521573, W--1521580, Y--11975y, Z--photo); Cooper & Slater 34 (A--isotype, B--photo of type, F--572718--isotype, G-isotype, K--photo of type, N--photo of type, N--photo of isotype, S--photo of type, W--1269807--type, W--1316764--isotype, Y--10134--isotype, Y--isotype, Z--photo of type, Z--photo of isotype); Dunlap 42 (F--689804); Stork 42 (Mi, W--1166830). Chiriqui: P. H. Allen 3661 (N, N).

CITHAREXYLUM COSTARICENSE Moldenke in Fedde, Repert. Sp. Nov. 37: 219--220. 1934.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 219--220. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 17. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 22 & 88. 1942; Moldenke, Alph. List Cit. 1: 301 & 320 (1946), 2: 344, 390, 419, & 436 (1948), 3: 945 (1949), and 4: 999 & 1025. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 39 & 179. 1949.

Shrub or tree, to 16 m. tall; trunk to 60 cm. wide at the base; bark light-brown, with regular and shallow narrow striations; cambium cream-colored with salmon-buff streaks; branchlets rather stout, more or less acutely tetragonal, dark-brown or blackish in drying, lenticellate, medullose, very minutely puberulent or glabrate; nodes annulate; principal internodes 1.5--4.7 cm. long; leaf-scars large, borne on stout corky sterigmata about 2 mm. long; leaves decussate-opposite or the uppermost approximate on young shoots; petioles stout, 10--13 mm. long, glabrous; leaf-blades firmly chartaceous, very bright-green and shiny on both surfaces, broadly oblong-elliptic or ovoid, 10.5--21.5 cm. long, 7.2--10.3 cm. wide, short-acuminate at the apex (occasionally only acute or rounded on stunted leaves), entire, beautifully rounded at the base, apparently not glanduliferous, perfectly glabrous on both surfaces or slightly scabrous because of a faint and finely raised vein reticulum on the upper surface; midrib stout, impressed above, prominent beneath; secondaries stoutish, 7--9 pairs, arcuate-ascending, rather obscurely anastomosing near the margins, impressed above, prominent beneath; veinlet reticulation very numerous and fine, equally prominulous and conspicuous on both surfaces; racemes terminal, compound, to 40 cm. long, the central branch 14--20 cm. long and to 1.5 cm. wide, the lateral branches about 2 pairs, opposite or approximate, each branch 8--19 cm. long, spreading, often nutant, all rather densely many-flowered; peduncles merging into the apex of the branchlets, similar to it in color and puberulence, 4--4.5 cm. long, bearing usually 1 node, which, in turn, bears a pair of small linear caducous bractlets; rachis stoutish, angulate-striate, brownish, glabrate or very obscurely puberulent; pedicels filiform, to 1 mm. long or obsolete; prophylla setaceous, to 1 mm. long; calyx campanulate, slightly curvate and asymmetrically borne on the pedicel, about 3.6 mm. long and 3.1 mm. wide, 5-costate, glabrous, its rim truncate and entire; corolla white, hypocrateriform, slightly curvate, its tube broadly cylindric, about 3.6 mm. long, about 2 mm. wide at the base, ampliate to 3.3 mm. at the apex, glabrate outside, densely pubescent in the throat within, its limb 5-parted, the lobes subequal, obovate-lingulate, about 2.1 mm. long and 1.8 mm. wide, rounded at the apex, pubescent; stamens 4, equaling the corolla-tube, didynamous, "forming a raised corona", 2 inserted about 1 mm. and the other two about 1.4 mm. below the mouth of the corolla-tube; filaments about 0.5 mm. long, more or less flattened; anthers ovate, about 0.7 mm. long and 0.3 mm. wide; pistil included; style about 1.6 mm. long, glabrous; stigma very shortly 2-lobed, the lobes about 0.6 mm. long, not fimbriate; ovary oblong, about 1.5 mm. long and wide, glabrous, 4-celled; fruiting-calyx and fruit not known.

The type of this species was collected by Adolfo Tonduz (no. 7369) in pastures at La Palma, San José, Costa Rica, at an altitude of 1460 meters, on September 19, 1898, and is deposited in the herbarium of the Chicago Natural History Museum. The species ascends to 2000 m. in the Caribbean cloud forest of Alajuela.

I am regarding the inflorescences here as compound because the separate lateral racemes do not arise from leaf-bearing nodes. The peduncle here and in all members of this genus is regarded as that part of the twig's apex which does not bear leaves and extends up to the lowest flower or lateral raceme. It may have one or more nodes like the branchlets, but these nodes either bear only a dormant bud and no foliar organs or else bear small bractlets entirely different in size and shape from the true leaves. In some cases the apparent peduncle here is abbreviated to 5 mm. and scattered lateral racemes are borne at or between the nodes of what is actually the much longer peduncle.

The species has been confused in the past with C. macrophyllum Poir. and C. reticulatum H.B.K. It is related to C. cooperi, which also has the impressed midrib and secondaries. In C. cooperi, however, the racemes are simple or bear only 2 very short branches at their base, the leaf-blades are subcoriaceous, gray-green, acute or short-cuneate at the base, mostly pubescent or puberulent beneath, and with the veinlet reticulation very obscure. In C. costaricense the racemes are always conspicuously compound, with the lateral branches usually 2 pairs and almost as long as the central one, the leaf-blades chartaceous, very bright-green on both surfaces, beautifully rounded at the base, perfectly glabrous on both surfaces, and with the veinlet reticulation very abundant and equally conspicuous and prominulous even to the finest divisions on both surfaces. Twenty-one herbarium specimens, including the type, and 7 mounted photographs have been examined.

Citations: COSTA RICA: Alajuela: A. Smith H.467 (F--919549, N). San José: Tonduz 7369 [Herb. Instit. Physico-geogr. Nat. Costaric. 12557] (B--isotype, B--isotype, B--isotype, B--photo of type, Bm--isotype, C--isotype, Cb--isotype, Cb--isotype, E--119055--isotype, F--76897--isotype, F--576597--type, G--isotype, K--isotype, K--isotype, K--photo of type, Mu--3827--isotype, N--isotype, N--photo of type, N--photo of isotype, Qu--isotype, S--photo of type, W--354353--isotype, W--1323216--isotype, X--isotype, X--isotype, Z--photo of type, Z--photo of isotype).

CITHAREXYLUM CRASSIFOLIUM Greenm. in Donn. Sm., Enum. Pl. Guat. 7: 70, hyponym (1905); Field Columb. Mus. Publ. Bot. 2: 186. 1907.

Synonymy: *Citharexylum cinereum* Donn. Sm. ex Greenm., Field Columb. Mus. Publ. Bot. 2: 186, in syn. 1907 [not *Citharexylon cinereum* L., 1851, nor Spreng., 1851, nor *Citharexylum cinereum* L., 1763, nor Sessé & Moc., 1894, nor Jacq., 1909, nor *Cytharexylon cinereum* L., 1934].

Literature: Donn. Sm., Enum. Pl. Guat. 6: 33 (1903) and 7: 70. 1905; Greenm., Field Columb. Mus. Publ. Bot. 2: 186. 1907; Prain, Ind. Kew. Suppl. 4: 49. 1913; Moldenke, Geogr. Distrib. Avicenn. 15. 1939; Moldenke, Alph. List Invalid Names 58. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 19 & 88. 1942; Moldenke, Alph. List Invalid Names Suppl. 1: 5. 1947; Moldenke, Alph. List Cit. 2: 351 (1948), 3: 947 & 973 (1949), and 4: 1012 & 1057. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 34 & 179. 1949.

Shrub or tree, to 13 m. tall; stems terete, covered with grayish bark; branchlets rather stoutish, obtusely tetragonal or subtetragonal, dark-gray or brownish, striate, the younger ones densely but very shortly pubescent or puberulent with dark-brown hairs, compressed at the nodes; nodes not noticeably annulate; principal internodes 1.5--4.2 cm. long; leaf-scars large, borne on large, thick, corky, ascending sterigmata 1--3 mm. long and 3 mm. wide; leaves decussate-opposite; petioles very stout, 5--10 mm. long, shallowly canaliculate with incurved margins above, 2--5 mm. thick, densely puberulent with extremely short dark-brown hairs, somewhat wrinkled in drying; leaf-blades very thick leathery-coriaceous or firmly subcoriaceous, dark- or deep-green to gray-green and shiny (rarely dull-green) above, paler or somewhat brighter green or light grass-green beneath, oblong or oblong-lanceolate to elliptic, 4.2--13 cm. long, 1.9--5 cm. wide, acute or obtuse to an emarginate or retuse apex, entire and slightly revolute along the margins, acute at the base and narrowed into the petiole, not noticeably granduliferous, very finely puberulent-scabrellous above with extremely minute hairs on elevated punctae, densely short-pubescent beneath; midrib stout, plane above (or slightly impressed toward the apex), very prominent beneath; secondaries rather stoutish, 5--7 pairs, mostly very irregularly disposed, very prominent beneath, arcuate-ascending, irregularly anastomosing near the margins; veinlet reticulation abundant, mostly conspicuous on both surfaces, very decidedly prominent beneath; racemes solitary or several and paniculately disposed, terminal or terminating short axillary twigs, nodding during anthesis, erect in fruit, 7--10 cm.

long, about 1 cm. wide, rather sparsely many-flowered; peduncles slender, 2--3.6 cm. long, densely puberulent with dark-brown antrorse hairs or short-hirsute, often bearing 1 or 2 pairs of bractlets; rachis similar to the peduncle in texture and pubescence; pedicels filiform, to 1 mm. long or less, densely puberulent; bractlets few, paired, linear, to 7 mm. long, densely short-pubescent or puberulent, sometimes unequally paired, somewhat canescent; prophylla setaceous or triangular, acute at the apex, to 1 mm. long, about equaling the pedicels, densely short-pubescent; flowers scented, 4--5 mm. long during anthesis; calyx pale-green, narrowly campanulate, 2--2.5 mm. long, 5-angled in cross-section, minutely pubescent on the outer surface, its rim shallowly sinuate;corolla white, tubular-infundibular, about twice as long as the calyx, its tube glabrous outside, pubescent (especially in the throat) within, the lobes subequal, ovate-rotund, 1--1.5 mm. long and wide, pubescent on both surfaces; perfect stamens 4, the fifth reduced to a minute staminode; style glabrous; ovary glabrous; fruit orange, subglobose, about 1 cm. long and wide.

The type of this species was collected by Hans von Türckheim (*no. 1308*) -- often cited as *J. D. Smith 1308* -- in a woods at Santa Rosa, Baja Verapaz, Guatemala, at an altitude of 1520 m., in July, 1887, and is deposited in the United States National Herbarium at Washington. It has been collected at altitudes of 1500 to 2600 m., in anthesis in January and October, and in fruit in December and January. It is said to inhabit dry slopes, forests, and ravines. It has been confused in herbaria with *C. donnell-smithii* Greenm. and with *C. cinereum* L. [=*C. fruticosum* L.]. It is easily distinguished, however, by the fact that its leaf-blades are thicker and more leathery in texture, dull-green, and not conspicuously reticulate-veined above, and the calyx is smaller. Eight herbarium specimens, in cluding the types of all the names involved, and 5 mounted photographs have been examined.

Citations: MEXICO: Chiapas: *Langman 3758* (W--2022087). GUATEMALA: Baja Verapaz: *Türckheim 1308* (B--photo of type, K--photo of type, N--isotype, N--photo of type, S--photo of type, W--1323194--type, Z--photo of type). Zacapa: *Steyermark 29789* (F--1040958), *42840* (N), *42845* (Ew, N), *43219* (N).

CITHAREXYLUM DAWEI Moldenke in Fedde, Repert. Sp. Nov. 37: 220--221. 1934.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 220--221. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 19 & 20. 1939; Moldenke, Alph. List Common Names 2. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 31, 32, & 88. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 145 (1946) and 2: 603. 1948: H. N. & A. L. Moldenke, Pl. Life 2: 55. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 59, 62, & 179. 1949; Moldenke, Alph. List Cit. 4: 1062. 1949.

Shrub or tree; branchlets rather slender or medium, very medullose, acutely tetragonal, on young shoots often decussately 4-margined, dark-brown, striate, glabrous, shiny; twigs slender, acutely tetragonal, usually lightly strigillose-pubescent; nodes annulate; principal internodes 0.6--6.8 cm. long; leaf-scars rather small, lunate or circular, on larger branchlets borne on very corky ascending sterigmata, 1--3 mm. long and 2--3 mm. wide; leaves decussate-opposite; petioles very slender, 4--17 mm. long, densely short-pubescent or glabrate, canaliculate above; leaf-blades membranous when immature, chartaceous when mature, dark-green and shiny above, somewhat lighter beneath, ovate-elliptic or broadly elliptic, mostly more or less falcate, 2.3--11 cm. long, 1.5--5 cm. wide, very lightly puberulent-strigillose above when immature, becoming glabrous in age, densely short-pubescent beneath, acute or short-acuminate at the apex, abruptly acute or attenuate-acuminate at the base, bearing a pair of small elongate glands at the base, entire or with a few coarse, broadly triangular, acute or obtuse, antrorse teeth along the margins to the middle; midrib comparatively stoutish, mostly short-pubescent above, prominent beneath; secondaries slender, 5--10 pairs, often indistinct, arcuate-ascending, anastomosing at the margins; veinlet reticulation often obscure; racemes terminal, terminating greatly abbreviated axillary twigs, or actually axillary, mostly erect, 4--11 cm. long, 1.2--2 cm. wide, rather densely many-flowered, occasionally bearing 1 or 2 short lateral branches at the base; peduncles slender, 1--1.5 cm. long or less, densely short-pubescent with dark-brown hairs; rachis slender, densely canescent-pubescent or brunnescent-pubescent even in fruit; pedicels filiform, 1 mm. long or less, elongate to 2 mm. (or longer) in fruit, densely short-pubescent; bractlets few, more or less foliaceous, to 1 cm. long and 5.8 mm. wide, densely pubescent, usually absent; prophylla setaceous, about 1 mm. long, densely short-pubescent; calyx campanulate, about 3.6 mm. long and 3.3 mm. wide, pubescent, plainly 5-costate, its rim 5-dentate, the teeth broadly triangular, about 0.5 mm. long and at the base 1.3 mm. wide; corolla hypocrateriform, its tube about 3.6 mm. long, about 1.5 mm. wide at the base, ampliate to 4.6 (!) mm. at the apex, glabrous outside, densely tomentose in the throat within, its lobes 5, rounded-elliptic, about 2.8 mm. long and wide, venose, pubescent, rounded at the apex; stamens 4, inserted about 1.3 mm. below the mouth of the corolla-tube, included, not distinctly didynamous; filaments about 0.5 mm. long; anthers ovate, about 0.5 mm. long and wide; pistil included; style about 1.5 mm. long, glabrous; stigma very shortly 2-lobed; ovary minute, subglobose; fruiting-calyx indurated, cupuliform, to 2.5 mm. long and 6 mm. wide, lightly short-pubescent or puberulent. its rim truncate, obscurely 5-angulate; fruit subglobose, about 6 mm. long and wide, black and very shiny in drying, fleshy, glabrous.

The type of this species was collected by Morley Thomas Dawe (no. 373) -- in whose honor it was named -- at Chipaque, Antioquia (?), Colombia, in July, 1916, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. The common name "agrecejo" is recorded by Dawe, but this name is also applied to C. fruticosum L. The species has been collected in anthesis and in fruit in July. It is apparently closely related to C. karsteni Moldenke, and has been confused with C. subthyrsoideum Pittier in herbaria. The Karsten specimens cited below differ in their denser pubescence on the lower leaf-surfaces, their generally narrower leaf-blades, and especially in the conspicuous vein and veinlet reticulation on both surfaces of the mature leaves. In the type collection the vein and veinlet reticulation is very obscure or even indiscernible. In the Karsten specimens the (immature) fruiting-calyx is also more distinctly 5-apiculate-toothed. Nine herbarium specimens, including the type, and 6 mounted photographs have been examined.

Citations: COLOMBIA: Antioquia?: Dawe 373 (B--photo of type, K--type, K--isotype, N--isotype, N--photo of type, S--photo of type, W--1423187--isotype, Z--photo of type). Boyacá: Karsten s. n. [Sogamoso] (N--photo, V, Z--photo). VENEZUELA: Anzoategui: Karsten s.n. [Piritu] (V). Delta Amacuro: Curran & Haman 1309 (Ca--924130), 1316 (Ca--924040, Ve--12548).

CITHAREXYLUM DECORUM Moldenke in Fedde, Repert. Sp. Nov. 37: 221--222. 1934.

Literature: Moldenke in Fedde, Repert. Sp. Nov. 37: 221--222. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Pittier, Supl. Plant. Usual. Venez. 54. 1939; Moldenke, Geogr. Distrib. Avicenn. 20. 1939; Moldenke, Alph. List Common Names 30. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 32 & 88. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 62 & 179. 1949; Moldenke, Alph. List Cit. 3: 820 (1949) and 4: 1050. 1949.

Small tree; branchlets medium-stout, rather acutely tetragonal, light-brown, very medullose, densely velutinous-pubescent; twigs somewhat more slender, otherwise similar to the branchlets in all respects; nodes obscurely or not at all annulate; principal internodes 1.2--6.5 cm. long; leaf-scars on larger branchlets and twigs borne on prominent, ascending, corky sterigmata to 3 mm. long and wide, subsessile on the youngest twigs and shoots; leaves decussate-opposite; petioles stout, 6--12 mm. long, densely velutinous-pubescent like the branchlets, with light-brown hairs to 1 mm. long, canaliculate above; leaf-blades firmly chartaceous, bright grayish-green and shiny above, deeper green beneath, elliptic, 7--14.7 cm. long, 4--6 cm. wide, acuminate at the apex (rarely obtuse on smaller leaves), entire, acute at the base and slightly prolonged into the petiole, bearing a pair of elongate glands at the very base, densely short-pubescent above, densely velutinous-pubescent beneath with straight light-brown hairs to 1 mm. long (or less); midrib rather stout, short-pubescent above, very prominent and much longer-pubescent beneath; secondaries slender, 5--8 pairs, ascending, almost straight (not arcuate), often furcate, prominulous beneath; vein and veinlet reticulation fine, abundant, prominulous beneath, often somewhat obscured by the velutinous pubescence; racemes terminal, unbranched, erect or pendent, 6--14 cm. long, 2--3 cm. wide in fruit, very densely many-flowered; peduncles slender, 1.7--3 cm. long, densely velutinous, often with a node and a pair of small caducous bractlets near the middle; rachis slender, densely velutinous-pubescent with light-brown hairs like the leaves, petioles, and branchlets; pedicels (in fruit) slender, 2--3.5 mm. long, densely pubescent; bractlets few, linear, about 4 mm. long, densely pubescent; prophylla linear, to 1.2 mm. long, densely pubescent; flowers not seen; fruiting-calyx indurated, cupuliform, 4--5 mm. long, about 5 mm. wide, closely investing the fruit, densely velutinous-pubescent, its rim deeply 5-lobed, the lobes about 2 mm. long and 3 mm. wide at the base, blunt at the apex, scarious-margined; fruit oblong, about 7.1 mm. long and 4.6 mm. wide, fleshy, orange-red when fresh, brown and wrinkled in drying, 2-lobed, apiculate at the apex by the persistent style, glabrous, shiny.

The type of this handsome species was collected by Henri François Pittier de Fábrega (*no. 10769*) on the ascent from Motatán bridge to Carvajal, near Valera, Trujillo, Venezuela, on November 21, 1922, and is deposited in the United States National Herbarium at Washington. The common name "totumillo" is recorded by Pittier in the reference cited above, but is a name also applied to *Aegiphila mollis* H.B.K., *Vitex compressa* Turcz., *V. divaricata* Sw., and *V. orinocensis* var. *multiflora* (Miq.) Huber.

This is a most handsome and distinct species because of its velutinou-pubescent branchlets, petioles, leaf-blades (especially the lower surface), peduncles, rachis, and calyx. The glands in this species, as in many other species of the genus, are borne on the lower surface of a narrow prolongation of the leaf-blade which extends a short distabce down the petiole and has its margins atrongly revolute so as almost to hide the elongate glands inside. The glands themselves are elongate in a direction parallel to the midrib and petiole. The species was confused by Pittier with *C. tomentosum* H.B.K. [=*C. kunthianum* Moldenke]. Six herbarium specimens, including the type, and 5 mounted photographs have been examined.

Citations: VENEZUELA: Trujillo: *H. Pittier 10738* (Ve), *10769* (B--photo of type, Cb--isotype, G--isotype, K--photo of type, N--isotype, N--photo of type, S--photo of type, Ve--12656--isotype, W--1187364--type, Z--photo of type).

CITHAREXYLUM DENTATUM D. Don, Edinb. New Philos. Journ. 11 (Jan.-Mar.): 237. 1831.

Synonymy: *Rauvolfia dentata* Tafalla ex D. Don, Edinb. New Philos. Journ. 11 (Jan.--Mar.): 237, in syn. 1831. *Rauwolfia dentata* Tafalla ex Walp., Repert. 4: 73, in syn. 1845.

Literature: D. Don, Edinb. New Philos. Journ. 11: Jan--Mar.): 237. 1831; Walp., Repert. 4: 73. 1845; Schau. in A. DC., Prodr. 11: 609. 1847; Jacks., Ind. Kew. 1: 549. 1893.

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THE HAWAIIAN BEACH SCAEVOLA (GOODENIACEAE)

Otto & Isa Degener

In 1950—51 the senior author scattered seeds of the common littoral Hawaiian Scaevola, locally called "naupaka kai", on Canton Atoll, just south of the Equator, in the Phoenix Archipelago. In February, 1958, thanks to the Civil Aeronautics Administration, the writers were able to study the Hawaiian plants, now flowering and fruiting, three foot high shrubs, growing beside the Canton plants, commonly twice or more as tall. They herewith make the two following nomenclatural changes:

1. SCAEVOLA SERICEA var. FAURIEI (Lévl.) Deg. & Deg., comb. nov.
   Syn. Scaevola Fauriei Lévl. in Fedd. Repert. 10: 150. 1912.

2. SCAEVOLA SERICEA var. FAURIEI forma MOOMOMIANA (Deg. & Greenw.) Deg. & Deg., comb. nov.
   Syn. Scaevola frutescens forma moomomiana Deg. & Greenw. Fl. Haw. 340: Scaevola : Frutescens 8/15/50.

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BOOK REVIEWS

Harold N. Moldenke

"Flora Hawaiiensis", by Otto Degener. Book 5. Published by the author, Waialua, Oahu, Hawaii.

The publication of the fifth volume of Degener's New Illustrated Flora of the Hawaiian Islands will be greeted with much satisfaction by botanists and naturalists everywhere. Published in looseleaf form, as were all the previous volumes, its pages may be inserted in their proper position in a taxonomic sequence by librarians through easy reference to a list of families included by the author for this purpose. The pages making up this volume were originally published between 1946 and 1957.

As usual, each species is beautifully illustrated with a line drawing of amazingly accurate and recognizable detail. Keys are included in all genera and families where they are essential for ready identification.

The reviewer is particularly pleased with this all-too-rare type of "flora" in the fact that sufficient space is provided under each taxon for more than just a thumbnail description. Here we find complete synonymy, type locality, original description, and often copious notes on relationships, economic uses, common names, and even bits of precious philosophy. This very valuable material is usually missing from the ordinary regional "floras", which are written in terse telegraphic style in order to serve the false god known as Brevity.

The present volume was made possible through a grant from the National Science Foundation, which is to be commended for its support of this important work on a floral assemblage so unique that it is 98 percent endemic. As the author so aptly comments "this work shall leave a fair record for generations yet unborn what the remarkable native vegetation.........was like before it was largely exterminated by feral goats and axis deer; introduced weeds and exotic forest trees; and by the practical, wholesale bulldozing and cultivating of vast areas for the production of sugarcane, pineapple and macadamia. Future generations may well shed a tear and be astonished how quickly and thoroughly their forebears wrecked the native vegetation of Hawaii Nei, the most unique natural Botanical Garden on the face of the Earth."

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NOTES ON NEW AND NOTEWORTHY PLANTS. XXII

Harold N. Moldenke

ABUTA ECUADORENSIS Moldenke, sp. nov.

Frutex scandens gracilis; ramis gracilibus densissime brunneo-villosis; foliis membranaceis ovato-oblongis 5-pli-nerviis acuminatis integris, ad basin acutis vel rotundatis usque ad subtruncatis, supra lamina glabris venis majoribus plusminusve pubescentibus, subtus lamina parce pilosis, venis majoribus minoribusque dense pubescentibus; fructis oblongis breviter pubescentibus.

Woody vine, to 80 meters long, forming a network in high treetops; trunk up to 15 x 9 cm. in diameter at a 1 meter level, oval in cross-section; stems very slender, very densely brown-villous; petioles slender, 2--7 cm. long, very densely brown-villous, somewhat swollen and often genuiflexuous at the apex; leaf-blades membranous or thin-chartaceous, shiny on both surfaces, brownish in drying, uniformly colored on both surfaces, 6--15.5 cm. long, 4--9 cm. wide, acuminate at the apex, entire, varying from acute or rounded to subtruncate at the base, distinctly 5-pli-nerved, the primary veins lightly arcuate-ascending, similar to the secondaries, not anastomosing at the margins, the secondaries 2 or rarely 3 pairs, more plainly arcuate especially at the very margins, but not anastomosing there, the tertiaries very numerous, issuing at right angles to the primaries and secondaries and connecting them, the lamina mostly glabrous above and very lightly scattered-pilose beneath, the primaries and secondaries mostly rather densely pubescent on both surfaces, the tertiaries glabrous above but pubescent beneath; flowers not known; fruit obliquely oblong or oval, green, 2.4--2.7 cm. long, 1.4--1.5 cm. wide, uniformly short-pubescent or puberulent throughout.

The type of this species was collected by Charles C. Fuller (no. 98) in a high dense jungle on the Upper Bobonaza, at an altitude of 1900 feet, Ecuador, on September 29, 1953, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector records the vernacular names "yana caspi" and "apa lamas angu" (Quichua) and states that the plant is claimed by the natives not to be poisonous.

AEGIPHILA VENEZUELENSIS var. SERRATA Moldenke, var. nov.

Haec varietas a forma speciei typica recedit foliis usque ad 29 cm. longis et 8.5 cm. latis apicem versus serrulatis.

This variety differs from the typical form of the species in having its leaves to 29 cm. long and 8.5 cm. wide, serrulate along the margins toward the base.

The type of the variety was collected by Bassett Maguire, John J. Wurdack, and George S. Bunting (no. 36952) in the uppermost slope forest of Camp 4, at an elevation of 1500--1700 meters, Cerro de la Neblina, Río Yatua, Amazonas, Venezuela, on December 27, 1953, and is deposited in the Britton Herbarium at the New York Botanical Garden.

ALOYSIA AYACUCHENSIS Moldenke, sp. nov.

Frutex; ramis gracilibus tetragonis glabratis costatis brachiatis; sarmentis numerosis valde abbreviatis floriferis; foliis numerosis confertis oppositis oblanceolatis parvis supra pustulosis, subtus resinoso-punctatis.

Shrub; branches slender and wiry, rather acutely tetragonal, often costate, glabrous or subglabrate, twiggy; twigs floriferous, short, opposite, usually 3--8 cm. long; principal internodes on branches 1.5--4 cm. long, on twigs 3--6 mm. long; larger nodes annulate; leaf-scars on twigs prominent, corky, divergent; leaves numerous, crowded on the twigs, thin-chartaceous, bright-green above, lighter beneath, narrowly oblanceolate, 6--10 mm. long, 1--3 mm. wide, rounded at the apex, entire and often somewhat revolute along the margins, attenuate-acute at the base, glabrous and pustulate above, resinous-punctate beneath, very obscurely strigillose on both surfaces when young; midrib filiform, plane above and beneath; secondaries 2 pairs, ascending, very short, indiscernible above, plane beneath; veinlet reticulation indiscernible on both surfaces; inflorescence terminating the short twigs, 1--2 cm. long, dense-flowered; rachis very slender, continuous with the twig, puberulent, the sympodia very much abbreviated; calyx about 2 mm. long, white-puberulent; corolla-tube about 4 mm. long, very densely white-pubescent above the calyx, the limb about 3 mm. wide, white-pubescent on the outside, glabrous within.

The type of this distinctive species was collected by Padre Loy at 2407 meters altitude in Ayacucho, Peru, and is no. 4187 in the herbarium of Padre J. Soukup, deposited in the Britton Herbarium at the New York Botanical Garden.

CLERODENDRUM SERRATUM var. PUBESCENS Moldenke, var. nov.

Haec varietas a forma speciei typica recedit ramis ramulisque inflorescentiisque densiore incano- vel griseo-tomentosis, foliorum laminis supra dense pilosis subtus densissime albo-tomentosis.

This variety differs from the typical form of the species in having its branches, branchlets, and inflorescences more densely incanous- or griseous-tomentose and the leaf-blades densely pilose above and very densely white-tomentose beneath.

The type of the variety was collected by S. K. Wagh (no. 2592) at Sunkarimeta, Vizag District, Andhra State, India, on May 11, 1956, and is deposited in the Blatter Herbarium at St. Xavier's College, Bombay. The collector states that the plant grows to a height of 20 feet, has a woody stem to 2 inches in diameter or more, and has flowers that are blue to white. He says that it is "not so common".

CLERODENDRUM VILLOSUM var. MACROCALYX Moldenke, var. nov.

Haec varietas a forma typica speciei recedit calyce 1.8—2.2 cm. longo, lobis ovatis 1.2--1.6 cm. longis ad apicem longe attenuatis.

This variety differs from the typical form of the species in having the calyx during anthesis very much larger, 1.8—2.2 cm. long, the lobes ovate, 1.2—1.6 cm. long, long-attenuate at the apex, densely glandular-dotted. The leaf-blades are remotely denticulate along the margins.

The type of the variety was collected by P. V. Bole (no. 1457) at Daudeli, North Kanara, Bombay, India, on December 25, 1955, and is deposited in the Blatter Herbarium at St. Xavier's College, Bombay. The collector notes that it is a shrub 3--4 feet tall, the corollas white, and the fruiting-calyx reddish. He says that it is frequent along railway lines.

GMELINA BRASSII Moldenke, sp. nov.

Arbor; foliis subcoriaceis late ellipticis vel subovatis breviter obtuseque acuminatis vel obtusis integerrimis, ad basin rotundatis vel subcordatis et biglandulosis utrinque pernitidisque; inflorescentiis terminalibus elongatis angustissimis racemosis vel pseudo-spicatis dense multifloris, floribus breviter pedicollatis; bracteis numerosissimis herbaceis perspicue 1—3-glandulosis; calycibus plerumque glanduliferis.

Tall tree, to 30 m. tall, the unbuttressed bole to 13 m. high, 25 cm. in diameter at breast height; bark about 6 mm. thick, the outer bark pale-brown, with shallow longitudinal fissures and dotted with coarse pustular lenticels, the inner bark cream-colored, tinged with green on the back, with yellow and white alternating layers within; sapwood about 5 cm. deep, pale straw-colored; heartwood very pale-brown; branchlets obtusely tetragonal, brunnescent, very minutely puberulent or glabrous, with scattered, light-colored, rather prominent lenticels; nodes not annulate; principal internodes 3--4 cm. long; leaves decussate-opposite; petioles rather stout, 2--5 cm. long, very minutely and obscurely appressed-puberulent or glabrous, flattened above, brunnescent; leaf-blades thin-coriaceous, bright- or dark-green above, lighter beneath, broadly elliptic or almost ovate, 8--25 cm. long, 4--16 cm. wide, very shortly acuminate at the apex with a broadly rounded acumen, or merely obtuse, entire, broadly rounded or subcordate at the base and marked there with 2 very prominent swellings above due to groups of close flat glands beneath; midrib flat above, prominent beneath; secondaries slender, 6 or 7 per side, ascending, slightly arcuate, anastomosing in many loops near the margins, flat above, prominent beneath; veinlet reticulation very abundant, flat and not conspicuous above, beautifully prominulous to the finest details beneath; inflorescence terminal, to 25 or more cm. long, 2--4 cm. wide, erect, racemose or pseudo-spicate, densely many-flowered, paniculate-branched at and toward the base with very short erect branches, the upper flowers arranged in subsessile cymules, densely short-puberulent with brownish hair throughout, very conspicuously bracteolate and glanduliferous; peduncles 3--4.5 cm. long, similar to the upper portion of the branchlets in all respects; sympodia 1--2.7 cm. long, more conspicuous toward the apex of the inflorescence; bractlets very numerous and conspicuous, elliptic or lanceolate, 5--17 mm. long, 1.5--8 mm. wide, tapering to the apex or caudate-acuminate, sessile, tapering to the base or the largest ones broadly rounded at the base, densely short-puberulent on both surfaces, usually conspicuously glanduliferous with 1--3 large, flat, black glands on the lower surface; pedicels very short, puberulent; calyx densely puberulent, usually also black-glanduliferous; corolla white or pinkish, to 2 cm. long, densely appressed-puberulent on the outside, the lower lip faint-blue with 2 yellow markings; fruit drupaceous, 10--14 mm. long and wide, blue-tipped, enclosed at the base by the fruiting-calyx, black when ripe.

The type of this species was collected by Leonard John Brass (no. 21915) -- in whose honor it is named -- in the rainforest on limestone, altitude 30 meters, at Dabora, on the Cape Vogel Peninsula, Milne Bay District, Papua, New Guinea, on April 10, 1953, and is deposited in the herbarium of the Department of Forests at Lae, New Guinea. A vernacular name is "alongaya", and its wood is used for carving drums.

GMELINA LEPIDOTA var. LANCEOLATA Moldenke, var. nov.

Haec varietas a forma speciei typica recedit foliorum laminis distincte lanceolatis longioribusque.

This variety differs from the typical form of the species in having its leaf-blades quite distinctly lanceolate and more elongated, 12--19 cm. long, 3--6 cm. wide, acuminate at the apex, and abruptly acute at the base.

The type of the variety was collected by K. Mair (no. 1894) in a rainforest on deep volcanic soil, altitude 1500 feet, at

Nantambu, Open Bay, New Britain, in June, 1945, and is deposited in the herbarium of the Department of Forests at Lae, New Guinea. It is said by the collector to be a tree 65 feet tall, the bole 45 feet high, buttressed to 4 feet, with a diameter of 2 feet at breast height, and a leafy crown. The outer bark is dark gray-brown, with closely spaced, irregular, longitudinal fissures, scaling off in 1/2 x 1/4 inch plates, with round black lenticellar pustules unevenly distributed, about 1/8 inch thick. The under bark is light creamy-yellow, the inner bark creamy-yellow with light-brown dappling, 3/8 inch thick. The sapwood is indefinite; the wood light straw-colored, with a greasy feel. He reports that the leaves are to 22.5 cm. (9 inches) long, simple, decussate, entire, tapering to the apex, dark-green, glabrous, and with prominent creamy-yellow veins above, dull gray-brown with stellate hairs and prominently raised veins beneath, the petioles 2.5—3 cm. long. The peduncles are tetragonal, the inflorescence terminal and axillary in the uppermost leaves, paniculate. The flowers are mauve, labiate, about 13 mm. long, in sessile opposite cymules, subtended by herbaceous bractlets, the corolla with dark-purple hairs on the outside.

GMELINA SMITHII Moldenke, sp. nov.

Arbor; nodis distincte annulatis; foliis firme chartaceis vel subcoriaceis ellipticis utrinque glabris; inflorescentiis terminalibus late paniculatis multifloris, ramis racemosis vel subspicatis; floribus breviter pedicellatis.

Tall tree, to 90 m. tall, the bole 30 m. high, hollow at the base, narrowly buttressed to 2.5 m., about 1 m. in diameter at breast height; bark 1.5—2 cm. thick, the outer bark pale blue-gray, with scattered cracks and with large flattened pustular lenticels, the inner bark yellow-brown, occasionally streaked with green on the back, brownish within, paler inwards, with a slight odor; branchlets rather stout, obtusely tetragonal, subglabrous, brunnescent; nodes plainly annulate; principal internodes 1.5—2 cm. long; leaves numerous, decussate-opposite, firmly chartaceous or subcoriaceous, but usually irregularly wrinkled in drying, green above, "brown beneath", glabrous on both surfaces, 7—15 or more cm. long, 4—10 or more cm. wide, rounded or acute at the apex, entire, rounded or acute at the base; midrib flat above, prominent beneath; secondaries slender, 6 or 7 per side, ascending, not much arcuate, joined in many loops near the margins, obscure above, prominulous beneath; vein and veinlet reticulation sparse, mostly indiscernible above and obscure beneath; inflorescence terminal, widely paniculate, to 30 cm. long and wide, the branches ascending or widely divaricate, densely many-flowered, densely brown-pubescent on the younger parts, glabrescent on the older parts and in age; bractlets numerous, lanceolate or narrow-elliptic, about 5 mm. long and 2—3 mm. wide, narrowed at both ends, densely puberulent on both surfaces, mostly hiding the buds and calyxes, sometimes blackish, caducous; pedicels very slender, 3—4 mm. long, or occasionally the basal ones to 10 mm. long, densely brown-pubescent; buds sometimes blackish; calyx campanulate, about 4 mm. long and wide, densely pubescent throughout, the rim 4-toothed; corolla pale-blue, the lower lobe with 2 yellow spots drawn out into lines inwards; fruit green, turning reddish.

The type of this species was collected by L. S. Smith (no. 1064) — in whose honor it is named — at Aiyura, at an altitude of 6000 feet, in the Central Highlands of Northeastern New Guinea, in October, 1944 (on the type label the date is given as "1/12/44", apparently in error), and is deposited in the herbarium of the Department of Forests at Lae, New Guinea. Vernacular names recorded are "kaboya" and "yabeina".

LANTANA BRASILIENSIS var. SEPTENTRIONALIS Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliis minoribus ellipticis 3.5—7.5 cm. longis 1.5—3.5 cm. latis.

This variety differs from the typical form of the species in having its leaves much smaller, 3.5—7.5 cm. long and 1.5—3.5 cm. wide.

The type of the variety was collected by Jaime Coêlho de Moraes (no. 1093) in high and somewhat wet places of the mata at Nazaré da Mata, Pernambuco, Brazil, and is deposited in the Britton Herbarium at the New York Botanical Garden.

LANTANA TRIFOLIA f. ALBIFLORA Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by my good friend and colleague, Dr. Erik Asplund (no. 15821) in a thicket, at an altitude of about 1150 meters, at Zaruma, El Oro, Ecuador, on March 19, 1955, and is deposited in the herbarium of the Naturhistoriska Riksmuseet at Stockholm.

LIPPIA MACEDOI Moldenke, sp. nov.

Suffrutex; caulibus ramisque gracilibus obtuse tetragonis sulcatis plerumque acute angulatis dense albido-strigosis; foliis brevissime petiolatis vel subsessilibus; laminis foliorum firmis vel subcoriaceis ellipticis acutis serratis, ad basin rotundatis vel subacutis, bullatis supra dense strigosis, subtus dense strigosis.

A subshrub; stems and branches slender, obtusely tetragonal and sulcate or sometimes more acutely angled, densely canescent-strigose, the hairs becoming brownish in age; nodes annulate; principal internodes 1.2—6.5 cm. long; leaves decussate-opposite, very short-petiolate or subsessile; petioles when present rather stoutish, to 2 mm. long, densely canescent strigose; leaf-blades firm-textured or even subcoriaceous, grayish-green on both surfaces but lighter beneath, elliptic, 2.7—5 cm. long, 1—2 cm. wide, acute at the apex, regularly serrate with rather appressed teeth from the apex to well below the middle, rounded or acutish at the base, bullate and densely strigose with bulbous-based hairs above, the hairs antrorsely confluent on each elevated portion between the deeply sunken veins, also densely strigose beneath with canescent hairs; midrib and the 5 pairs of slender secondaries deeply impressed above and very sharply prominent beneath, the secondaries ascending and slightly arcuate; tertiaries very numerous, slender, rather straight and subparallel, issuing at almost right angles to the secondaries, impressed above and very slightly prominulous beneath; inflorescence axillary, capitate or subspicate, solitary in each of the upper axils; peduncles slender, rather sharply tetragonal, densely white-strigose with antrorse hairs, 1.5—3.5 cm. long, ascending, stiff; heads ovoid, 6—15 mm. long, 9—11 mm. wide; bracts ovate, the lowest ones to 6 mm. long and 3 mm. wide, acuminate at the apex, rather densely canescent-strigose with antrorse hairs, the peripheral ones long, stiffer, and bulbous-based; corolla rose, about 6 mm. long, the tube densely short-pubescent outside, the limb about 2.5 mm. wide.

The type of this distinctive species was collected by Amaro Macedo (no. 4423) — in whose honor it is named — in a field at Jacubá, municipality of Niquelandia, Goyaz, Brazil, on February 24, 1956, and is deposited in the United States National Herbarium at Washington.

STACHYTARPHETA MONACHINOI Moldenke, sp. nov.

Planta perennis subarbuscula caespitosa; caulibus simplicibus puberulis brunnescentibus; foliis numerosis ternatis oblongis integris acutis glabris brunnescentibus; inflorescentiis terminalibus multifloris minute puberulis brunnescentibus.

Subshrub, to 40 cm. tall, cespitose; stems apparently simple, obtusely tetragonal, lightly puberulent, brunnescent; principal internodes 1—2.5 cm. long; nodes not annulate; leaves numerous, ternate or sometimes scattered, ascending, longer than the internodes, sessile, chartaceous, oblong, 2—4 cm. long, 4—8 mm. wide, acute at the apex, entire, glabrous, brunnescent in drying; midrib very slender, slightly prominulent only beneath; secondaries and veinlets not distinguishable on either surface; inflorescence terminal, apparently solitary and many-flowered, apparently 10 or more cm. long, sometimes complanate-fasciated; rachis minutely puberulent, more of less costate; bracts lanceolate, about 6 mm. long and 2 mm. wide, acuminate at the apex, obscurely ciliolate; calyx tubular, about 15 mm. long and 2 mm. wide, very obscurely puberulent or subglabrate, 5-ribbed, the marginal teeth subulate and about 4 mm. long, often twisted; corolla hypocrateriform, rose-violet, its tube about 2 cm. long, glabrous, the limb about 1 cm. wide.

The type of this species was collected by Geraldo Mendes Magalhães (no. 6024) in dry flat ground covered with grasses and shrubs on a fragmented quartz campo on the high plateau of Serra do Cobral, altitude about 1000 meters, municipality of Buenopolis, Minas Gerais, Brazil, on October 13, 1953, and is no. 48281 in the herbarium of the Jardim Botânico de Belo Horizonte, deposited in my personal herbarium at Yonkers, New York. It is named in honor of my good friend and colleague, Joseph Vincent Monachino (1911—), who has done considerable collecting of plants in various portions of the United States and Venezuela and has published many critical notes on various plant groups.

SYNGONANTHUS CAULESCENS var. PROLIFERUS Moldenke, var. nov.

Haec varietas a forma typica speciei recedit bracteolis interioribus plerumque elongatis foliaceis viridibus glabris usque ad 7 mm. longis 1 mm. latis argute attenuatis saepe scarioso-marginatis.

This variety differs from the typical form of the species in having many or most of the inner bractlets enlarged, foliaceous, green, to 7 mm. long and 1 mm. wide, glabrous, sharply attenuate at the apex, often more or less scarious-margined.

The type of the variety was collected by my good friends, Lyman Bradford Smith and Raulino Reitz (no. 8681) in a bog at Fazenda Frei Rogerio, 12 km. southeast of Pôrto União, altitude about 750 m., municipality of Pôrto União, Santa Catarina, Brazil, on December 18, 1956, and is deposited in the United States National Herbarium at Washington.

SYNGONANTHUS TRICHOPHYLLUS Moldenke, sp. nov.

Herba parva; caulibus dense foliosis; foliis filiformibus utrinque glabris membranaceis; pedunculis erectis filiformibus stramineis 2-costatis 2-sulcatis glabris nitidis; vaginis appressis olivaceis glabris striatis; capitulis obconicis flavidis vel albidis ca. 3 mm. latis.

Dwarf herb; stems to 3 cm. long, densely foliose; leaves filiform, 1—2.5 cm. long, uniformly bright-green on both surfaces, glabrous on both surfaces, blunt at the apex, membranous; peduncles solitary at the apex of the stem, erect, filiform, 4—5 cm. long, stramineous, 2-costate, 2-sulcate, glabrous, shiny; sheath appressed, about 1 cm. long, olivaceous, glabrous, striate, the blade lanceolate, acute at the apex, erect, not ciliate; heads obconic, yellow or whitish, about 3 mm. wide; receptacle long-conic, about 2 mm. long, more or less whitish-pilose, bearing plainly visible scars where florets have been shed; staminate florets not seen; pistillate florets: sepals 3, separate, hyaline, about 1.75 mm. long and 0.5 mm. wide, obtuse at the apex, glabrous throughout; petals 3, spatulate, connate at the middle, hyaline, about 1 mm. long and 0.25 mm. wide, obtuse at the apex, glabrous throughout; style about 0.5 mm. long, glabrous; stigmas 3; ovary about 0.35 mm. long, glabrous, 3-celled.

The type of this distinct species was collected by Hernando García y Barriga and Richard Evans Schultes (no. 14138) in rocky soil mixed with white sand, Sabana de la Angostura, altitude 400 meters, Araracuara, Río Caquetá, Amazonas, Colombia, on December 21, 1951, and is deposited in my personal herbarium at Yonkers, New York. Unfortunately, only very old and shattered heads were available for dissection, with no staminate florets remaining. The very distinctive conic receptacle bears numerous hyaline structures which may be receptacular bractlets or sepals. Younger and better preserved material is needed to settle the floral characters of this plant more completely.

xVERBENA FECUNDA Moldenke, nom. nov.

This name is hereby proposed for the fertile hybrids described by Dermen in Cytologia 7: 168 (1936) between Verbena canadensis (L.) Britton [including V. canadensis var. atroviolacea Hort. and V. canadensis var. compacta Hort.] and V. ambrosifolia var. eglandulosa Perry.

xVERBENA FERAX Moldenke, nom. nov.

This name is hereby proposed for the fertile hybrids described by Dermen in Cytologia 7: 168 (1936) between Verbena canadensis (L.) Britton [including V. canadensis var. atroviolacea Hort. and V. canadensis var. compacta Hort.] and V. racemosa Eggert.

xVERBENA GOODMANI Moldenke, hybr. nov.

Planta hybrida naturalis inter Verbena stricta Vent. et V. halei Small aspectu intermedia; foliis incisis lobatisque subtus dense canescenti-pubescentibus; caulibus ramisque pedunculisque rhachidibusque calicibusque dense canescenti-pubescentibus.

This is a natural hybrid between Verbena stricta Vent. and V. halei Small, with intermediate characters. The leaves are variously incised and lobed as in V. halei, but are densely canescent-pubescent beneath and to 7 cm. long and 4.5 cm. wide. The stems and branches are densely canescent-pubescent, as are also the peduncles, rachids, and calyxes. The spikes are very numerous and very slender, to 30 cm. long, with overlapping calyxes, very sparsely fruited.

The type of this hybrid was collected by my good friend and colleage, George Jones Goodman (no. 6474) — in whose honor it is named — along a roadside 3 miles north of Willis, Marshall County, Oklahoma, on June 28, 1957, and is deposited in my personal herbarium at Yonkers, New York. The collector notes that the hybrid is infrequent among the two parents.

VERBENA HASSLERANA var. OVATIFOLIA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliorum laminis multo parvioribus ovatis et petiolis filiformibus 4—5 mm. longis.

This variety differs from the typical form of the species in having its leaf-blades much smaller, ovate, 1.8—3.3 cm. long, 0.6—2 cm. wide, and the filiform petioles only 4—5 mm. long.

The type of the variety was collected by Lyman Bradford Smith and R. Klein (no. 8478) in ruderal situations at Rio Negrinho, munivipality of Rio Negrinho, Santa Catarina, Brazil, on December 8, 1956, and is deposited in my personal herbarium at Yonkers, New York.

VERBENA PARANENSIS Moldenke, sp. nov.

Herba; caulibus ramisque dense hirsutis; foliis rotundo-ovatis, ad basin subcuneatis, utrinque dense villosis margine regulariter dentatis, venis supra impressis; inflorescentiis terminalibus subcapitatis multifloris; pedunculis gracilibus dense hirsutis; corolla parva violacea.

Herb; stem apparently procumbent or decumbent and rooting, tetragonal, densely hirsute with fulvous-brown hairs; branches tetragonal, densely hirsute with fulvous-brown hairs; principal internodes 1--7 cm. long, elongated on the side branches; leaves decussate-opposite; petioles 1--3 mm. long, obscure, very densely hirsute like the branches; leaf-blades chartaceous, rounded-ovate, somewhat lighter beneath, 1--2.3 cm. long, 8--25 mm. wide, rounded in outline at the apex, more or less subcuneate or acute at the base, coarsely but regularly dentate along the margins with acute or subacute teeth, densely villous on both surfaces with long, brownish, more or less appressed hairs, the pubescence somewhat more grayish beneath; midrib very slender, impressed above, prominulous beneath; secondaries slender, 3--5 per side, ascending, hardly arcuate, impressed above, prominulous beneath; veinlet reticulation sparse, obscure on both surfaces; inflorescence terminal, subcapitate, densely villosulous throughout, many-flowered, the heads about 1.5 cm. long and wide; peduncles very slender, 1.5--3 cm. long, densely hirsutulous with fulvous-brown hairs; calyx tubular, straight, about 3 mm. long, densely villosulous or hirsutulous externally, its rim 5-toothed, the teeth about 0.7 mm. long; corolla hypocrateriform, violet, its tube about 5 mm. long, densely barbate-tomentose in the throat, the limb 5-parted, about 2.5--3 mm. wide, the lobes obovate; stamens 4, included, didynamous, 2 inserted at about the middle and the other 2 above the middle of the corolla-tube; style glabrous, about 4 mm. long, included; stigma 2-lobed, only one lobe papillose.

The type of this remarkable species was collected by my good friend, Gert Hatschbach (no. 4214) in the campo along the road to Palmeirinha, municipality of Guarapuava, Paraná, Brazil, on November 15, 1957, and is deposited in my personal herbarium at Yonkers, New York. The species is very distinct because of its capitate inflorescences and very small flowers.

VERBENA RIGIDA var. GLANDULIFERA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit inflorescentiis dense glanduloso-puberulis.

This variety differs from the typical form of the species in having the peduncles, rachis, bractlets, and calyxes densely glandular-puberulent and the bractlets only very shortly and sparsely ciliolate.

The type of this variety was collected by Gert Hatschbach (no. 4212) along the roadside at Laranjeiras do Sul, municipality of Guarapuava, Paraná, Brazil, on November 15, 1957, and is deposited in my personal herbarium at Yonkers, New York.

VITEX SPRUCEI var. VAUPESENSIS Moldenke, var. nov.

Haec varietas a forma typica speciei foliis trifoliolatis differt.

This variety differs from the typical form of the species in having its leaflets uniformly three in number.

The type of this variety was collected by Bassett Maguire, John J. Wurdack, and W. M. Keith (no. 41839) in a small savanna 0.5--1.5 km. north of Puerto Colombia, on the Río Guainia opposite to Maroa, Vaupés, Colombia, at an elevation of 130 meters, on October 12, 1947, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collectors describe the plant as a tree 3--8 meters tall, the corollas white, the lip with a basal yellow spot, and state that it is frequent in the type locality.

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS CITHAREXYLUM. III

Harold N. Moldenke

CITHAREXYLUM DENTATUM D. Don

Additional literature: Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 159. 1894; Moldenke, Geogr. Distrib. Avicenn. 23. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34 & 88. 1942; Moldenke, Alph. List Cit. 1: 251 & 325 (1946), 2: 328, 338, & 427 (1948), 3: 690, 801, 802, & 880 (1949), and 4: 1065, 1112, & 1113. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 71 & 179. 1949.

Unarmed shrub or tree, to 5 m. tall, much branched; branches and branchlets medium-slender, stiff, dark-brown, obtusely or more or less acutely tetragonal, minutely puberulent with dark hairs or scurf or glabrate; twigs more slender, dark, more acutely tetragonal, minutely puberulent; nodes rather obscurely annulate; principal internodes 0.7--3.5 cm. long; leaf-scars large, borne on large, stout, ascending, corky sterigmata 1--2.5 mm. long; leaves very numerous, crowded, decussate-opposite; petioles stout, 1--10 mm. long, minutely puberulent or glabrate, corky (especially at the base); leaf-blades very stiff-coriaceous and rigid, dark-green, usually brunneous or nigrescent on both surfaces in drying, very shiny and glossy above, usually oblong or obovate-oblong (or the largest ones subobovate-elliptic to elliptic), 1.1--3.1 cm. long, 7--19 mm. wide, obtusely rounded or acute at the apex, cuneately narrowed to the base, not glanduliferous, subentire or (usually) more or less sharply and rather irregularly serrate toward the apex or to below the middle, usually more or less revolute along the margins when dry, glabrate and more or less densely punctate and scabrid on both surfaces; midrib slender, plane above, prominent beneath; secondaries slender, 4--6 pairs, short, ascending, usually not much arcuate, prominulous beneath, obscure above; veinlet reticulation rather sparse, obscure on both surfaces or prominulous beneath; racemes abbreviated, terminal, erect or nutant, unbranched, 1—3.5 cm. long, about 1.5 cm. wide, few- or many-flowered; peduncles slender and abbreviated or obsolete; rachis slender, densely puberulent; pedicels to 1 mm. long or obsolete, in fruit elongate to 4.5 mm. and greatly incrassate and indurated; prophylla minute and setaceous or linear and to 3 mm. long; calyx cyathiform, prominently 5—7-angled and -veined, its rim 6- or 7-dentate or 5—7-fid; corolla glabrous outside, villous at the throat within, its tube about half again as long as the calyx; fruiting-calyx indurated, campanulate (or cupuliform in age), to 5 mm. long and 8 mm. wide, dark and heavy, glabrate, its rim distinctly 5-lobed, the lobes about 1.5 mm. long, triangular, acute, to 3 mm. wide at the base; fruit subglobose, to 1 cm. long and wide, glabrous, apiculate when immature, black and shiny outside, green within, 2-lobed; seeds 2, hemispheric.

The type of this species was collected by Hipólito Ruíz at Maccos [=Mancos?, Ancash], Peru, in 1794. The flowers are described as "brown" and fragrant. The extremely heavy stiff-coriaceous leaves which (along with the branches, branchlets, twigs, and inflorescences) usually become dark-brown or black in drying and the abbreviated racemes characterize this species well. The teeth on the leaf-blades are usually sharp-pointed and spreading, but vary to obtuse and appressed, and are often very irregular in length and shape even on the same leaf. Their margins are often very slightly revolute. The species ascends to 3700 meters, and has been collected in anthesis in May, and in fruit in January and June. It has been confused with *C. ilicifolium* H.B.K., which, however, does not have the tremendously thickened and stiff leaves of this species. Schauer says, also, that in *C. dentatum* the leaves are scabrid, not truly spinose-dentate, and the calyx is deeply incised. The Pearce specimen, cited below, is notable in not having become at all brunneous nor nigrescent in drying. The fruit of this species is invariably described as black, even when fresh; it is said to be used for marking ink and writing ink. The species inhabits hills and mountains and is often found in dense thickets of mixed shrubs. Seventeen herbarium specimens, including the type collection, and 9 mounted photographs have been examined.

Citations: PERU: Ancash: *Ruíz s.n.* [Maccos; Macbride photos 17592] (B—isotype, F—663021—photo of isotype, F—843324—isotype, K—photo of isotype, Kr—photo of isotype, L—isotype, N—photo of isotype, N—photo of isotype, S—photo of isotype, Z—photo of isotype); *Weberbauer 3285* (B). Ayacucho: *Pearce s. n.* [Huanta, 1867] (K); *Weberbauer 5537* (B, B, B, E—1008720, F—628593, G, N, N—photo, W—1473540, Z—photo). Huancavelica: *Stork & Horton 10336* (Ca—655852). Department undetermined: *Pavon s.n.* (Cb); *Pearce s.n.* [western slope of the Andes, 0°—40° S., 1861—63] (Bm, N).

CITHAREXYLUM DISCOLOR Turcz., Bull. Soc. Nat. Imp. Mosc. 36 (2): 209. 1863.

Synonymy: Citharexylum glandulosum Urb. & Ekm. in Urb., Arkiv. Bot. Stockh. 22a, 17: 107. 1929 [not C. glandulosum Poepp., 1940]. Citarexylum discolor Turcz. ex Alain in León & Alain, Fl. Cub. 4: 301, sphalm. 1957.

Literature: Turcz., Bull. Soc. Nat. Imp. Mosc. 36 (2): 209. 1863; Jacks., Ind. Kew. 1: 549. 1893; O. E. Schulz in Urb., Symb. Antill. 6: 68. 1909; Urb., Arkiv. Bot. Stockh. 22a, 17: 107. 1929; Moldenke, Geogr. Distrib. Avicenn. 5 & 7. 1939; Moldenke, Alph. List Common Names 14. 1939; Moldenke, Prelim. Alph. List Invalid Names 16. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 24, 26, & 88. 1942; Moldenke, Alph. List Invalid Names 14. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 3, 74, 186—189, 298, & 321 (1946), 2: 338, 408, 448, 487, & 647 (1948), 3: 664, 708, 757, & 868 (1949), and 4: 1068 & 1143. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 43, 47, & 179. 1949; Alain in León & Alain, Fl. Cuba 4: 299 & 301. 1957.

Shrub or small tree; branches and branchlets rather slender, more or less tetragonal (often acutely and sharply so), very light-gray (almost white), glabrous or lightly puberulent; twigs very slender, usually brown in drying, glabrate; nodes annulate on twigs and young shoots, obscurely so on older wood; principal internodes 6—33 mm. long or much shorter; leaf-scars varying from small and appressed to large and circular and borne on stout, greatly swollen, corky sterigmata, which on young shoots have a greatly ampliate-margined apex and on older wood are very corky and 1—4 mm. long and 2 mm. wide; leaves decussate-opposite; petioles slender or very slender, 0.7—3.7 cm. long, ampliate at the base, weak, glabrous or subglabrate; leaf-blades membranous or thin-membranous, very dark-green above, very light-green beneath, oblong or elliptic, 4—11.7 cm. long, 1.7—4.5 cm. wide, acute or very shortly and abruptly acuminate at the apex, entire (or occasionally so abruptly narrowed above into the acumination as to appear 2-toothed there), acute or subcuneate at the base, with 1—3 pairs of large or small black disk-like glands at the very base, glabrous and shiny above (or puberulent along the midrib and larger veins when immature), densely puberulent with extremely minute hair or glabrate and shiny beneath, the midrib and secondaries sometimes strigillose beneath, rather abundantly glandular-punctate beneath and marked with 6—12 scattered black or brown glandular disks; midrib slender or very slender, plane or subimpressed above, prominulous beneath; secondaries very slender, 3—6 pairs, irregular, arcuate-ascending, often anastomosing several mm. from the margins or not anastomosing, plane above, prominulous beneath; vein and veinlet reticulation extremely tenuous and delicate, abundant, obscure or indiscernible above, conspicuous but not at all prominulous beneath; racemes numerous, terminal and terminating short axillary twigs and shoots, mostly erect (or nutant in fruit), abbreviated, 2.5—8.5 cm. long, simple, many-flowered, 1--1.8 cm. wide; peduncles very slender, 1--2.7 cm. long or less, glabrous or subglabrate, often with 1-3 nodes, each bearing a pair of small foliaceous and caducous bracts or linear bractlets; rachis slender, glabrous or subglabrate; pedicels very slender or filiform, to 1 mm. long, glabrous or subglabrate, elongate to 3 mm. in fruit; prophylla setaceous, 1 mm. long or less; flowers erecto-patent; calyx obconic, about 2 mm. long, 5-costate, glabrous outside, its rim truncate but with the 5 ribs prolonged into 5 tuberculate teeth; corolla white, its tube hypocrateriform, about 7.5 mm. long, villous in the throat, the limb split to about 1/4 its length, glabrous on both surfaces, the lobes 5, oblong; stamens 5; filaments about 0.5 mm. long; anthers about 1 mm. long; pistil short, about 2.5 mm. long; style about 1 mm. long; stigma emarginate, about as wide as the style; ovary ellipsoid; fruiting-calyx cupuliform, slightly indurated, to 2.5 mm. long and 4.5 mm. wide, 5-ribbed, glabrate, its rim 5-angulate or obscurely 5-toothed with extremely shallow teeth; fruit subglobose, 4--7 mm. long and wide, 2-lobed, apiculate when immature, nigrescent in drying, glabrous.

The type of this species was collected by Jean Jules Linden (*no. 1826*) on Mount Liban, at an altitude of 4000 feet, near Santiago de Cuba, Oriente, Cuba, and is deposited in the herbarium at Kharkov, Russia. The type of *C. glandulosum* was collected by Erik Leonard Ekman (*no. H.5894*) on eruptive rock in a shady gulch, at an altitude of 1200 meters, at Morne Malanga, Massif de la Salle, Crête-a-Piquanta, Port-au-Prince, Haiti, on April 20, 1926, and is deposited in the herbarium of the Naturhistoriska Riksmuseet at Stockholm. Ekman comments as follows about his plant: "If this is *C. lucidum*, then it is a most peculiar form." Besides *C. lucidum* Schlecht. & Cham., the species has been confused with *C. caudatum* L., *C. quadrangulare* Jacq., *C. tristachyum* Turcz., and the genus *Cordia*. It ascends to 1400 meters in the Sierra Maestra. In the Dominican Republic it has been found at 1100 meters and is said to be "not so rare" between 1500 and 2000 meters altitude. It has been collected in anthesis in April, May, July, and August, and in fruit in May. It is said to inhabit woods, pinelands, and the borders of rivulets. The extremely thin-membranous leaf-blades, whose vein and veinlet reticulation is extremely conspicuous, but not at all prominulous, on the lower surface (usually rather sparse near the midrib), mark this species well. The sterigmata are extremely conspicuous and prominent in some forms (*e.g.*, *C. Wright 435*). The Bucher collection cited below is placed here tentatively. Its racemes remind one of *C. tristachyum*, but its leaves are those of *C. discolor*. At least, it is certainly not *C. caudatum* as misidentified by Standley. The common name "guayo" is recorded, but applies also to *C. fruticosum* L. and to *Petitia domingensis* Jacq.

Fifty-nine herbarium specimens, including the type collections of all the names involved, and 12 mounted drawings and photographs have been examined.

Citations: CUBA: Oriente: Acuna 9231 (Es), 13862 (Es), s.n. (Es—4231); Alain, Acuña, & López Figueiras 5552 (Sm); G. C. Bucher 1 (F—598810, Y—15996); Ekman 14430 (B, S), 14459 (B, S); León 11074 (Ha, N); López Figueiras 2146 (Z); Linden 1826 (B—isotype, B—drawing of isotype, B—photo of isotype, Bm—isotype, Br—isotype, Cb—isotype, Cb—isotype, Cb—isotype, F-686848—isotype, K—isotype, K—isotype, K—isotype, K—isotype, K—isotype, K—photo of isotype, N—isotype, N—photo of isotype, P—isotype, S—photo of isotype, V—285045—isotype, X—isotype, Z—photo of isotype); Roig & Bucher 6686 (N), s.n. [Herb. Roig 6686] (Es, N); C. Wright 435 [Jan.-Jul. 1859] (G, K), 435 [1860] (Cb, K, L, N, N—photo, Os, P, V—211815, Z—photo). HISPANIOLA: Dominican Republic: Ekman H.11913 (B, N, S), H.12773 (B, N, S, W—1557854); R. A. Howard 12285 (N), 12304 (N). Haiti: Ekman H.5894 (B, B—photo, Ca—608041, F—839448, K—photo, Mi, N, N—photo, S, S, Z—photo); Herb. Lamarck 263 (P); J. Martin 963 (Cb).

CITHAREXYLUM DONNELL-SMITHII Greenm. in Donn. Sm., Enum. Pl. Guatem. 7: 70, hyponym. 1905; Greenm., Field Columb. Mus. Publ. Bot. 2: 186—187. 1907.

Synonymy: Citharexylum caudatum Donn. Sm. ex Greenm., Field Columb. Mus. Publ. Bot. 2: 187, in syn. (in part). 1907 [not C. caudatum L., 1774, not Citharexylon caudatum L.,1763]. Citharexylon odoratissimum Ørst. ex Moldenke, Prelim. Alph. List Invalid Names 17, in syn. 1940. Citharexylum odoratissimum Ørst. ex Moldenke, Prelim. Alph. List Invalid Names 17, in syn. 1940 [not C. odoratissimum Schiede & Deppe, 1940]. Citharexylum ghiesbreghtii Moldenke, Phytologia 1: 413. 1940.

Literature: Donn. Sm., Enum. Pl. Guatem. 7: 70. 1905; Greenm., Field Columb. Mus. Publ. Bot. 2: 186—187. 1907; Prain, Ind. Kew. Suppl. 3: 43 (1908) and 4: 49. 1913; Standl., Field Mus. Publ. Bot. 18: 1000. 1938; Moldenke, Geogr. Distrib. Avicenn. 13 & 15—17. 1939; Moldenke, Alph. List Common Names 6, 9, 10, 21, 24, & 28. 1939; Moldenke, Prelim. Alph. List Invalid Names 17. 1940; Moldenke, Phytologia 1: 413. 1940; Calderon & Standl., Fl. Salvad., ed. 2, 236. 1941; Moldenke, Alph. List Invalid Names 14 & 15. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16, 19, 21—23, 71, & 88. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 5, 39, 88, 89, 142, 234, 268, 320, & 321. 1946; Salisb., Ind. Kew. Suppl. 10: 53. 1947; H. N. & A. L. Moldenke, Plant Life 2: 61 & 84. 1948; Moldenke, Alph. List Cit. 2: 330, 344, 345, 347—349, 351, 389, 390, 424, 447, & 554 (1948), 3: 748, 780, 784, 817, 821, 849, 869, 940, 945, 948, 958—962, 973, & 978 (1949), and 4: 999, 1000, 1019, 1024, 1026, 1031, 1042, 1047—1049, 1052—1055, 1057, 1061, 1082, 1120, & 1303. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29, 34, 38—40, 157, & 179. 1949; H. N. & A. L. Moldenke, Anal.

Inst. Biol. Mex. 20: 4. 1949; Moldenke, Phytologia 3: 284 (1950) and 5: 24. 1954.

Small, medium-sized, or large expansive tree, to 18 m. tall, or shrub only 1 m. tall; crown broad and dense; trunk to 76 cm. in diameter at the base; bark dark gary-brown or nearly black, much furrowed and roughened in age; branchlets and twigs slender or medium-slender, acutely or obtusely tetragonal, buff or brownish, often very dark, often striate and more or less lenticellate, sparselt strigillose or (usually) perfectly glabrous, more or less shiny; nodes somewhat ampliate, annulate, often oblique; principal internodes 0.7—6 cm. long; leaf-scars large, borne on rather short and more or less conspicuous sterigmata; leaves decussate-opposite (or merely approximate with internodes up to 1 cm. in length between the members of a pair); petioles slender or stoutish, 1—2.5 cm. long, not noticeably ampliate at the base, flattened and usually somewhat canaliculate (especially toward the apex) above, obscurely and very sparsely pulverulent-puberulent or more usually glabrous; leaf-blades chartaceous or thin-chartaceous, rather firm, rather uniformly bright- or dark-green on both surfaces or rich-green above and paler beneath when fresh, varying from lanceolate or oblong-lanceolate to elliptic, 4.5—21 cm. long, 2.1—6.5 cm. wide, acuminate at the apex or attenuate to a subacuminate point (rarely obtuse or emarginate on stunted leaves), entire (or rarely dentate with a few, short, acute teeth near the apex), acute or cuneate at the base, with 1—3 pairs of small discoid or oblong glands at the very base, glabrous and sometimes sparsely punctate on both surfaces; midrib rather slender, mostly plane or prominulous within a channel above, prominent beneath, sometimes very sparsely and minutely strigillose-puberulent above; secondaries very slender, 8—15 pairs, numerous and close together, regularly arcuate-ascending, not anastomosing at the margins, flattened or subprominulous above, sharply prominulous beneath; vein and veinlet reticulation fine and very abundant, sometimes prominulous (especially above), not at all conspicuous, with usually many subparallel veinlets extending more or less straight from the midrib to or toward the margins; racemes numerous, much elongate, axillary in the uppermost leaf-axils or (usually) terminal, often crowded at the tips of the branchlets, simple or occasionally compound with 1—3 pairs of lateral branches, the central one 10—45 cm. long, 1—1.8 cm. wide, the lateral ones (when present) about 10 cm. long or less, all densely many-flowered, recurved and nutant or pendent; peduncles slender, 1.5—6 cm. long, sparsely strigillose or (usually) glabrous; rachis slender, glabrous; pedicels slender or very slender, 1—3.5 mm. long, spreading, elongate to 6 mm. in fruit, sparsely strigillose or usually glabrous; bractlets linear, few, to 5 mm. long, glabrate; prophylla setaceous, 1—2 mm. long or less, sessile, sharp-pointed; flowers fragrant; calyx campanulate or tubular-campanulate, 2—3 mm. long, about 2 mm. wide, glabrous except for the puberulent rim, strongly 5-angled in cross-section, sinuately 5-dentate and ciliolate at the rim;

corolla white, yellowish-white, or greenish-white, varying to cream-colored or creamy buff, tubular-campanulate, usually about twice as long as the calyx, 5--8 mm. long, glabrous externally, its tube more greenish-white than the limb, externally glabrous, pubescent within, the limb about 5 mm. in diameter, subequally 5-lobed, the lobes white, spreading, oblong, about 2 mm. long, rounded at the apex, pubescent on the upper (inner) surface, glabrous on the outer (lower) surface; perfect stamens 4, slightly exserted from the corolla-tube; style glabrous; ovary glabrous; fruiting-calyx campanulate, herbaceous, light, to 3 mm. long and 5 mm. wide, glabrous, its rim spreading, subentire or more or less obscurely 5-apiculate, becoming obtusely 5-lobed or -split in age; fruit oblong or oblong-spherical, 6—7 mm. long, about 6 mm. wide, glabrous, extremely shiny and glossy, fleshy, varying from orange to reddish or pale-reddish and very showy when fresh, black or purplish-black to bluish and wrinkled in drying, 2-lobed; pyrenes submeniscoidal, 5—6 mm. long, 3—3.5 mm. wide, smooth.

The type of this species was collected by John Donnell Smith (*no. 1879*) — in whose honor it is named — at Pacaya, Amatitlan, Guatemala, at an altitude of 5500 feet, in March, 1890, and is deposited in the Gray Herbarium of Harvard University at Cambridge, Mass. The type of *C. odoratissimum* was collected by Anders Sandøe Ørsted (*no. 11193*) at an altitude of 8000 feet on Mount Barbá, Heredia, Costa Rica, and is deposited in the herbarium of the Universitetets Botaniske Museum at Copenhagen. The type of *C. ghiesbreghtii* was collected by Auguste Boniface Ghiesbreght — in whose honor it is named — in the state of Oaxaca, Mexico, in 1842, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. It is in general more strigillose throughout than the typical material of the species.

The species has been collected in anthesis from December through March and in July and August, and in fruit in January, March, April, and July. It has been confused by some herbarium workers with *C. caudatum* L., which it closely resembles, and with *C. villosum* Jacq. [=*C. fruticosum* var. *villosum* (Jacq.) O. E. Schulz], which it does not even remotely resemble. It inhabits brushy slopes, mixed oak and pine forests on hills, cafetal, light and moist or wet forests, damp dense forests, roadsides, pastures, wet forested quebradas, densely forested barrancas, mountainsides, the edges of quebradas bordering sugarcane fields, and the clay-loam of pasture lands. It has been found at altitudes of from 1000 to 2650 meters.

The greatly elongate and extremely densely flowered racemes and long narrow-lanceolate leaves characterize this species well. Its pedicels are also longer than is usual in the genus. The leaf-blades are mostly 2.1—4.5 cm. wide — those that are 5—6.5 cm. wide are exceptional and are not at all typical. Tonduz reports that the tree has a dense and rounded crown. Steyermark calls the leaves "firmly membranaceous" or "subcoriaceous". Standley says that it is abundant in Quezaltenango, common at altitudes of 1950 to 2400 meters. Smith reports that it is "heavily fruited in April and without flowers at that time", "common and well distributed in Alajuela.....in forests and pastures.....the fruit greatly favored by wild pigeons." He erroneously refers to the flowers as being "in spikes". Among the many common and vernacular names recorded for the plant are "buela noche", "buena noche", "chuul", "cola de pava", "coralillo", "coral negro", "cordencillo", "cordoncillo", "cuul", "dama", "damas", "moca de pava", "moco de pava", "paraiso", "seguilla", "soguillo", "sorguillo", and "uva".

It is cultivated in Guatemala and El Salvador. Calderón reports that the flowers are very fragrant early in the night. The El Salvador form seems to be a much smaller-flowered form, at least insofar as the Calderón and Padilla specimens indicate; the Standley specimens from the same country approach the type in flower-size. Standley states that the species gets to be a tree 30 feet high, with a dense crown and drooping racemes, and is found along roadsides and in cafetal and potrero formations. A form with small short calyxes is exemplified by Skutch 1977, White 214, and Standley 63872, 63874, and 64953. A form with large long calyxes is exemplified by Davidson 483, Standley 63037, Steyermark 35260, and Tonduz 9623. Intermediate-sized calyxes are seen on Smith A.153 and Standley 61269 and 67782. On Standley 63294 there are small, intermediate, and even some rather large calyxes on the same branch, while Pittier s.n. shows intermediate and small ones on the same raceme!

One hundred twenty-nine herbarium specimens, including the types of all the names involved, and 11 mounted photographs have been examined.

Citations: MEXICO: Chiapas: Little & Sharp 9941 (N). Oaxaca: Ghiesbreght s.n. [1842] (N, N--photo, P, Z--photo). GUATEMALA: Amatitlan: Hayes s.n. [July 21, 1860] (G); J. D. Smith 1879 (B--isotype, B--photo of type, C--isotype, G--type, K--isotype, K--photo of type, N--photo of type, S--photo of type, W--42711--isotype, W--1323196--isotype, W--1323197--isotype, Z--photo of type). Escuintla: P. C. Standley 63874 (F--988616, N). Guatemala: Aguilar 92 (F--969020); P. C. Standley 61269 (F--985354), 63037 (F--995429, N). Quezaltenango: Skutch 1977 (F--934284, N); P. C. Standley 33711 (F--1043481), 67782 (F--992777), 67893 (F--979721, N), 83689 (N), 83715 (N). Sacatepéquez: Bernoulli & Cario 3403 (B, K, L); Rojas 324 (B, B--869011, N--photo, W--1014994, Z--photo); P. C. Standley 64953 (F--988176); Steyermark 35260 (F--1057345). Department undetermined: Morales Ruano 636 (W--1316974), 1019 (W--1407194). EL SALVADOR: Ahuachapán: Padilla 301 (N, W--1166784); Pittier 2006 (N, W--578401). La Libertad: M. C. Carlson 228 (N). San Salvador: Renson 216 (N, N--photo, W--399508, Z--photo); P. C. Standley 22988 (G, N, W--1138697). Santa Ana: Calderón 2256 (G, W--1266624). San Vicente: Calderón 341 (G, N, W--1151359), 342 (G, N, W--1151360); P. C. Standley 21531 (G, N, W--1137332). COSTA RICA: Alajuela: A. Smith 4126 (F--905618), H.153 (F--919533). Heredia: Ørsted 11193 (Cp, W--1269902); Tonduz s.n. [Herb. Instit. Physico-geogr. Nat. Costaric. 1741] (Br, Br, W--1323200). San José: C. Hoffmann s.n. [12.54] (B); Pittier s.n. [Herb. Instit. Physico-geogr. Nat. Costaric. 9624] (F--576910); Pittier & Tonduz 9624 (Bm, Br, Br, W--1323203, W--1323204); Skutch 3098 (N, S); P. C. Standley 32434 (W--1225722), 41706 (F--599151); Standley & Valerio 48045 (W--1305400); Stork 2421 (F--592077, Mi); Tonduz 1419 [521] (Bm, Br, Br, W--1323199), 7855 [1836] (Br, Br, W--1323201, X), 9623 (B, Bm, Br, F--576679, P, W--1323195, W--1323202, X), 9624 (B, L, P, X), s.n. [Herb. Physico-geogr. Nat. Costaric. 11646] (B, Bm, Br, P, P, W--1323205), s.n. [Herb. Physico-geogr. Nat. Costaric. 11796] (B, B, Bm, Br, Br, G, N, N, P, P, S, W--333955, W--392065), s.n. [Herb. Instit. Physico-geogr. Nat. Costaric. 12502] (V--10967); Valerio 174 (F--670539). Province undetermined: Tonduz 1274 [1573] (Br, Br, W--1323206), s.n. [Herb. Instit. Physico-geogr. Nat. Costaric. 10703] (Cp). PANAMA: Chiriquí: Davidson 483 (F--927597); Peggy White 214 (F--1005200). CULTIVATED: El Salvador: Calderón 1638 (G, W--1168888). Guatemala: Moldenke & Moldenke 19815 (N); P. C. Standley 63294 (F--975840), 63872 (F--985736).

CITHAREXYLUM DRYANDERAE Moldenke, Phytologia 2: 13--14. 1941.

Synonymy: Citharexylum dryanderi Moldenke, Suppl. List Invalid Names 2, in syn. 1941.

Literature: Moldenke, Phytologia 2: 13--14. 1941; Moldenke, Suppl. List Invalid Names 2. 1941; Moldenke, Alph. List Invalid Names 14. 1942; Moldenke, Alph. List Cit. 1: 166. 1944; H. N. & A. L. Moldenke, Plant Life 2: 57. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 59 & 179. 1949; Moldenke, Alph. List Cit. 4: 1075. 1949; Salisb., Ind. Kew. Suppl. 11: 55. 1953.

Tree, about 5 m. tall; branchlets stout, acutely tetragonal, rather densely farinaceous-puberulent with sordid-brownish furf; nodes flattened, not annulate; leaf-scars very large, ampliate, corky; principal internodes 2--5 cm. long; leaves decussate-opposite; petioles stoutish, 3--4.5 cm. long, rather densely farinaceous-puberulent like the branchlets, wrinkled-striate in drying, ampliate at the base; leaf-blades coriaceous, gray-green and shiny above, yellow-green beneath, elliptic, 11--19 cm. long, 3--7 cm. wide, acute at the apex, entire, usually acute (sometimes rounded) at the base, glabrous above, densely appressed-tomentellous or furfuraceous with yellowish furf beneath, bearing 2 large prominent glands parallel to the petiole at the very base; midrib stout, impressed above, very prominent beneath; secondaries slender, 10--15 per side, arcuate-ascending, flat and rather inconspicuous above, very prominent and glabrous beneath; veinlet reticulation abundant, flat and often rather inconspicuous above, the larger portions prominulous and glabrous beneath; inflorescence racemose-subspicate, 8—14 cm. long, many-flowered, solitary in the upper axils, erect; flowers not seen; fruiting-peduncles stout, 1—2.5 cm. long, more or less densely appressed-furfuraceous; rachis in fruit stout and wrinkled-striate, densely appressed-furfuraceous with brownish furf; fruiting-pedicels stout and incrassate, about 1 mm. long or less, densely appressed-furfuraceous; fruiting-calyx indurated, 5—6 mm. long, 9—10 mm. wide, venose, glabrate, the rim irregularly lobed; fruit drupaceous, red, fleshy, oblong-elliptic, 7—12 mm. long, 5—9 mm. wide, glabrous, shiny.

The type of this species was collected by Editha Ida Dryander (no. 2362) — in whose honor it is named — at an altitude of 2000 meters in Valle del Cauca, Colombia, fruiting in May, 1939, and is deposited in the United States National Herbarium at Washington. Two herbarium specimens and 2 mounted photographs have been examined.

Citations: COLOMBIA: Valle del Cauca: Dryander 2362 (N—isotype, N—photo of type, W—1778716—type, Z—photo of type).

CITHAREXYLUM EKMANI Moldenke, Geogr. Distrib. Avicenn. 5, nom. nud. (1939), Carib. Forester 2: 13. 1940.

Synonymy: Citharexylum ekmanii Moldenke ex Alain in León & Alain, Fl. Cuba 4: 301, sphalm. 1957.

Literature: Moldenke, Geogr. Distrib. Avicenn. 5. 1939; Moldenke, Carib. Forester 2: 13. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 24 & 88. 1942; Moldenke, Alph. List Cit. 1: 187. 1946; H. N. & A. L. Moldenke, Plant Life 2: 57. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 43 & 179. 1949; Salisb., Ind. Kew. Suppl. 11: 55. 1953; Alain in León & Alain, Fl. Cuba 4: 299 & 301. 1957.

Shrub; branches and branchlets very acutely tetragonal with margined angles, brown, striate between the angles, very obscurely puberulent or glabrate; nodes annulate; principal internodes 2—5 cm. long; leaves decussate-opposite; petioles very slender, 5—9 mm. long, minutely puberulent or glabrate; leaf-blades membranous, very dark-green on both surfaces, brunnescent or nigrescent in drying, sometimes slightly lighter beneath, ovate-elliptic or lanceolate, 2.5—8.5 cm. long, 1.5—3.5 cm. wide, acuminate or even subcaudate at the apex, subentire or (usually) sparsely and irregularly coarse-dentate with 1—3 large acute or obtuse teeth on each side, very sparsely strigillose above or glabrate in age, densely strigillose-pubescent with distichous hairs along the midrib, secondaries, and larger venation beneath, the pubescence more dense on immature leaves and then extending also to the lamina, especially toward the base, beneath; midrib very slender, flat above, very slightly prominulous beneath; secondaries very slender, 3—5 per side, arcuate-ascending, not anastomosing, very slightly prominulous beneath; vein and veinlet reticulation very fine and delicate, indiscernible above, not at all prominulous beneath; inflorescence and fruit not seen.

The type of this species was collected by Erik Leonard Ekman (*no. 13889*) — in whose honor it is named — among steep overhanging rocks in the mountains at Lomas de Siguanca, Las Villas, Cuba, on June 4, 1922, and is deposited in the herbarium of the Naturhistoriska Riksmuseet at Stockholm. The only other known collection of the species is from rocky hills at Río Navarro, south of Cumanayagua, in the mountains of the Siguanca-Trinidad group, Las Villas, and was collected on February 15, 1924. Both collections are sterile. It is hoped that more and better material will soon be available. Only 4 herbarium specimens, including the type, and 4 mounted photographs have been examined.

Citations: CUBA: Las Villas: *Ekman 13889* (B—isotype, N—photo of type, S—type, Z—photo of type), *18528* (N, N—photo, S, Z—photo).

CITHAREXYLUM ELLIPTICUM Sessé & Moc. ex D. Don, Edinb. New Philos. Journ. 11 (Jan.—Mar.): 238. 1831.

Synonymy: *Citharexylum lucidum* D. Don, Edinb. New Philos. Journ. 11 (Jan.—Mar.): 238. 1831 [not *C. lucidum* Schlecht. & Cham., 1830, nor Cham., 1861, nor Griseb., 1909, nor C. DC., 1942]. *Citharexylum scariosum* Sessé & Moc. ex D. Don, Edinb. New Philos. Journ. 11 (Jan.—Mar.): 238. 1831. *Citharexylon scariosum* Moc. & Sessé apud Walp., Repert. 4: 75. 1845. *Citharexylon ellipticum* Moc. & Sessé apud Walp., Repert. 4: 75. 1845. *Citharexylum scariosum* Moc. & Sessé apud Schau. in A. DC., Prodr. 11: 614. 1847. *Citharexylum ellipticum* Moc. & Sessé ex Jacks., Ind. Kew. 1: 549. 1893. *Citharexylum reticulatum* Cham. ex O. E. Schulz in Urb., Symb. Antil. 6: 69, in syn. 1909 [not *C. reticulatum* H.B.K., 1817, nor Donn. Sm., 1907]. *Cytharexilum scariosum* Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 24, in syn. 1940. *Cytarexilum ellipticum* Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 24, in syn. 1940. *Cutarexilum ellipticum* Sessé & Moc. ex Moldenke, Suppl. List Invalid Names 3, in syn. 1941. *Cithaexylum ellipticum* Sessé & Moc. ex Roig, Plant. Medic. 778, sphalm. 1945. *Cithaexylon ellipticum* Sessé & Moc. ex Moldenke, Alph. List Invalid Names Suppl. 1: 4, in syn. 1947. *Citarexylum ellipticum* Sessé & Moc. ex Alain in León & Alain, Fl. Cuba 4: 298 & 299. 1957. *Citarexylum reticulatum* Cham. ex Alain in León & Alain, Fl. Cuba 4: 299, in syn. 1957. *Citharexylum affine* Linden, in herb. [not *C. affine* D. Don, 1831, nor Mart. & Gal., 1940, nor *Citharexylon affine* Mart. & Gal., 1844].

Literature: D. Don, Edinb. New Philos. Journ. 11 (Jan.—Mar.): 238. 1831; Walp., Repert. 4: 74—75. 1845; Schau. in A. DC., Prodr. 11: 614. 1847; Jacks., Ind. Kew. 1: 549—550. 1893; O. E. Schulz in Urb., Symb. Antil. 6: 69. 1909; Roig y Mesa, Est. Exp. Agron. Santiago Vegas Bol. 54: 39 & 793. 1928; Moldenke, Annot. List 108. 1939; Moldenke, Alph. List

Common Names 2. 1939; Moldenke, Geogr. Distrib. Avicenn. 5, 13, & 36. 1939; Moldenke, Prelim. Alph. List Invalid Names 16, 17, & 24. 1940; Moldenke, Suppl. List Invalid Names 3. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16, 24, 71, & 88. 1942; Moldenke, Alph. List Invalid Names 14, 15, 22, 23, & 58. 1942; Moldenke, Phytologia 2: 96. 1944; Roig y Mesa, Plant. Medic. 778. 1945; Moldenke, Alph. List Cit. 1: 66, 138, 187, 218, 243, 246, 251, 261, 272, 306, 307, 309, 312, 314, & 323. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 4 & 5. 1947; Moldenke, Phytologia 2: 387. 1947; Moldenke, Alph. List Cit. 2: 339, 349, 419, 422, 431, 437, 486, 487, 499, 500, 569, 578, 579, 646, 648, 651, & 652 (1948), 3: 656, 659, 663, 668, 743, 754, 771, 779, 801, 834, 867, 886, 900, & 926 (1949), and 4: 986, 1028, 1029, 1036, 1065, 1068, 1084, 1085, 1216, 1231, 1295 & 1304. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29, 43, 157, & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Roig y Mesa, Dicc. Bot. 1: 94, 283, & 910 and 2: 1003. 1953; P. Ponce de Leon, Rev. Soc. Cub. Bot. 10: 23. 1953; Moldenke, Journ. Calif. Hort. Soc. 15: 85. 1954; Alain in León & Alain, Fl. Cuba 4: 298 & 299. 1957.

Straggling or scandent shrub or small tree, to 4 m. tall, spreading to 8 m.; branches and branchlets medium-stout, yellow-brown or gray, medullose, rather sharply tetragonal, prominently many-ribbed, densely or rather sparsely short-puberulent toward the apex, becoming glabrate in age; nodes annulate; principal internodes 0.9--5.5 cm. long; leaf-scars borne on very short ascending sterigmata or the sterigmata becoming greatly enlarged and corky on older branches; leaves decussate-opposite or occasionally subopposite; petioles slender or rather ampliate in age, 3--9 mm. long, glabrous, usually more or less margined on mature leaves; leaf-blades firmly chartaceous or subcoriaceous, uniformly green on both surfaces, often very light- or grayish-green, elliptic, 3--9.1 cm. long, 1.5--5.4 cm. wide, obtusely rounded and emarginate at the apex or obtusely rounded to a very short cucullate acumination, entire or slightly and irregularly undulate along the margins, varying from rounded to acute or subcuneate at the base, bearing a pair of small or elongate glands at the very base, glabrous on both surfaces (or occasionally very obscurely puberulent on the midrib and venation), mostly dull; midrib very slender, prominulous on both surfaces; secondaries very slender, 3--5 pairs, ascending, not very arcuate, prominulous on both surfaces; vein and veinlet reticulation decidedly and conspicuously prominulous on both surfaces on mature leaves; racemes axillary in the uppermost leaf-axils and terminal, 9--23 cm. long, 1--1.7 cm. wide, many-flowered, mostly erect, sometimes bearing 1 or 2 branches at or near the base; peduncles stout, ribbed, puberulent or glabrous, 1--6.7 cm. long, sometimes bearing bracteate or bracteolate nodes; rachis stout or stoutish, puberulent or glabrate, ribbed; pedicels slender, 1--2 mm. long, elongate to 4 mm. in fruit, puberulent or glabrate; bracts more or less foliaceous, of various shapes and dimensions, caducous; bractlets linear, 5--10 mm. long, often absent; prophylla setaceous, 1—2 mm. long, puberulent or canescent; corolla white; fruiting-calyx indurated, cupuliform or eventually patelliform, about 3.5 mm. long, 5—6 mm. wide, obscurely puberulent or glabrous, ribbed, its rim truncate and entire; fruit subglobose, 4—9 mm. long and wide, fleshy, orange-red (or black when mature?), black in drying, becoming somewhat wrinkled in drying, glabrous, very shiny, apiculate by the persistent style when immature.

The type of this species was collected by Martin Sessé, José Mariano Mociño, Castillo, and Maldonado (*no. 2366*) in Mexico, and is deposited in the herbarium of the Jardin Botanico at Madrid. It is labeled "*Cytarexilum ellipticum*. N." The species has been collected in anthesis from January through March and from June through September, and in fruit in January, March, April, and from June through August. It often attains a height of only about 1 meter. The subcoriaceous, glabrous, elliptic leaves, which are rounded and mostly emarginate or else rounded to a short cucullate (caudate and curvate) acumination at the apex and whose nervation is decidedly prominulous and conspicuous on both surfaces, characterize this species well, as also its prominently ribbed branches, branchlets, twigs, peduncles, rachis, and calyx. It has been confused by herbarium workers with *C. fruticosum* L., *C. tristachyum* Turcz., *C. reticulatum* H.B.K., *C. coriaceum* Desf. [=*C. fruticosum* L.], *C. cinereum* Sessé & Moc. [=*C. fruticosum*], and *C. cinereum* L. [=*C. fruticosum*]. The Taylor collection exhibits one leaf that has a sparsely sharp-dentate margin! Don includes *C. cinereum* Sessé & Moc. in the synonymy of his *C. lucidum*, but Sessé & Mociño's type specimen was from Puerto Rico and therefore cannot represent that species.

Jack reports the species as a "coarse spreading shrub, 10 feet high, spreading 20—25 ft." and as "a straggling shrub" and "coarse scandent shrub or small tree". The fruit is said by him to be black at maturity even when fresh, but Greenman states that in Mexico the fruit is red when fresh (perhaps still immature?). Britton and Wilson also describe the fruit as orange-red in Cuba.

Most of the Cuban specimens are taken from cultivated material, but a few are apparently from escaped or naturalized plants, as may be inferred from *Ekman 17200*, which was collected "on cliffs along the beach" at Matanzas City, while the *León, Victorin, & Alain 19722* is from a "wayside" in Matanzas. In Mexico, where it is native, it inhabits sand dunes. Lluy records the vernacular name "anacahueta" and states that the plant has medicinal properties. Roig adds the names "anacahuita," "anacagüita", "citarexilon", and "verbenato". The Hartling collection, cited below, is from a plant which was grown from seeds of *N. L. Britton 508*, originally collected in Havana in 1905.

Schauer cites *C. affine* Mart. & Gal. as a synonym of this species, but that name actually belongs in the synonymy of *C.*

hexangulare Greenm. The *LeSueur 640* collection cited below is not at all typical. Its leaves are very thin-membranous, small, rounded-elliptic, often with a pair of coarse rounded teeth near the apex, much resembling forms of *C. berlandieri* B. L. Robinson, but without the latter's pubescence. In all, 152 herbarium specimens, including the types of all the names involved, and 5 mounted photographs and descriptions have been examined.

Citations: MEXICO: Veracruz: *Galeotti 7001* (Cb, P), *7097* (Br); *Gouin s.n.* [29.X.1867] (N, P, P); *Greenman 56* (F—189521, F—189975, G, N, N—photo, W—752569, Z—photo); *Houstoun s.n.* [1730] (Bm); *LeSueur 640* (Au, F—1003664, Fs); *Liebmann 11361* (Cp, F—614007); *Linden 11* (Br, Br, K), *71* (K); *F. Müller 203* (N, N); *Orcutt 2904* (Du—155521, F—279032); *Purpus 6142* (Bm, Ca—168096, E—704896, F—386653, G, N, W—464664); *Rutten & Rutten-Pekelharing 842* (Ut); *Schiede 127* (Mu—762); *Schiede & Deppe 127* (B, B, E—119060, L, L, V); *Von Chrismar s.n.* (B, B, B). State undetermined: *Pavon s.n.* [Nueva España] (X, X); *Sessé Mociño, Castillo, & Maldonado 2365bis* (F—849579, Q), *2366* (F—849564—isotype, N—photo of type, Q—type, Z—photo of type), *2368* (F—851465, Q). CUBA: Havana: *León 7085* (Ha). Matanzas: *Ekman 17200* (B, N, S); *León 7814* (Ha, N), *8799* (Ha, N), *13905* (Ha, N); *León & Roca 7874* (N); *León, Victorin, & Alain 19722* (Ha, N, N); *Rutten & Rutten-Pekelharing 148* (Ut, Ut). CULTIVATED: California: *Wells, Lammerts, & McClintock s.n.* [October 30-31, 1944] (N). Cuba: *Britton & Wilson 508* (N); *Curtiss 621* [Jan. 28] (A, B, B, Bm, Cb, Cb, Cm, Cp, D—571391, E—119073, Ed, Es, F—184707, G, It, K, Le, Mu—4000, N, P, Vt, W—522242), *621* [April 23] (A, B, B, Bm, Cb, Cb, Cm, Cp, D—571391, E—119073, Ed, Es, F—184707, G, It, K, Le, Mu—4000, N, P, Vt, W—522242); *Jack 7353* (A, Cp), *7662* (A, Ba, N, S, W—1478236), *8460* (A, N, W—1556366); *León 7085* [Herb. Roig 5783] (Es, N); *Lluy s.n.* [Herb. Roig 3600] (Es); *Moldenke & Moldenke 19891* (Es, F, Lg, Mg, Mo, N, No, Ot, S, Sm), *20598* (Fy, Fy, N); *Van Hermann 2698* (B, Ca—139879, F—189072, Po—63527), *7698* (A, Es, N). New York: *Hartling s.n.* [N. Y. Bot. Gard. Cult. Plants 19267] (Ur); *H. N. Moldenke 8380* (Br, N, N, Z); *N. Taylor s.n.* [N. Y. Bot. Gard. Cult. Plants 19267] (N). MOUNTED DESCRIPTIONS: Original description of *C. lucidum* (F—227194).

CITHAREXYLUM ENDLICHII Moldenke in Fedde, Repert. 37: 222.1934.

Literature: Moldenke in Fedde, Repert. 37: 222. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Alph. List Common Names 21. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 192. 1946; H. N. & A. L. Moldenke, Plant Life 2: 58. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949.

Shrub, to 2 m. tall; branches stout, woody, stiff, black or dark-brown; branchlets woody, stoutish, obscurely tetragonal, short, stiff, irregular, black or very dark-brown, furfuraceous-puberulent, with very dark or blackish hairs; young shoots slender, very densely pubescent with rather long, regular, canescent hairs; nodes not discernibly annulate; principal internodes greatly abbreviated, 2--14 mm. long; leaf-scars borne on comparatively large and very prominent sterigmata; leaves numerous, decussate-opposite, crowded; petioles slender, 3--6 mm. long, densely pubescent; leaf-blades firmly chartaceous, dark-green on both surfaces, oblong-elliptic or obovate in outline, 1.6--2.8 cm. long, 7--15 mm. wide, triangular-acute at the apex, coarsely and deeply dentate along the margins above the middle or to the middle, with 2, 4, or 6 large antrorse (often almost lobe-like) teeth, distinctly revolute throughout, acute or subcuneate at the base (the glands not apparent), densely short-pubescent on both surfaces, especially along the larger venation beneath; midrib extremely slender, impressed above, prominulous beneath; secondaries extremely slender, 3--5 pairs, ascending, not at all arcuate, impressed above, slightly prominulous beneath; veinlet reticulation fine, conspicuously impressed above, obscure beneath; racemes abbreviated to 1 or 2 flowers, axillary or terminal; peduncles slender, 1--3 mm. long, canescent-pubescent; flowers not seen; fruiting-pedicels 1--2 mm. long, pubescent or puberulent; bracts and bractlets absent; fruiting-calyx cupuliform, about 3.5 mm. long and 6.5 mm. wide, densely puberulent or short-pubescent, light and herbaceous in texture, its rim 5-apiculate, with the apiculations about 1 mm. long; fruit subglobose or oblong, to 6 mm. long and 5.5 mm. wide, 2-lobed, fleshy, glabrous, shiny.

The type of this species was collected by Rudolf Endlich (no. 217) — in whose honor it is named — in the Sierra de Yamón, at an altitude of 2400 meters, Durango, Mexico, on September 2, 1903, and is deposited in the herbarium of the Botanisches Museum at Berlin. The collector records the vernacular name "manzano del cerro". The species reminds one of C. flabellifolium S. Wats. in its leaf-form. Only the type specimen and 4 mounted photographs have been examined.

Citations: MEXICO: Durango: Endlich 217 (B--type, K--photo of type, N--photo of type, S--photo of type, Z--photo of type).

CITHAREXYLUM EOLIGNITICUM Berry, U. S. Geol. Surv. Prof. Paper 91: 346--347 & 455, pl. 106, fig. 10 [as "Citharexylon"]. 1916; Moldenke, Geogr. Distrib. Avicenn. 41. 1939.

Literature: Berry, U. S. Geol. Surv. Prof. Paper 91: 346--347 & 455, pl. 106, fig. 10. 1916; Knowlton, U. S. Geol. Surv. Bull. 696: 177. 1919; Moldenke, Geogr. Distrib. Avicenn. 41. 1939; Moldenke, Prelim. Alph. List Invalid Names 15. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 88. 1942; Moldenke, Alph. List Invalid Names 13. 1942; H. N. & A. L. Moldenke, Plant Life 2: 42. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 166 & 179. 1949.

Illustrations: Berry, U. S. Geol. Surv. Prof. Paper 91: pl.

106, fig. 10. 1916.

Petioles short, very stout; leaf-blades ovate-lanceolate in outline, about 8 cm. long, about 2.75 cm. wide at the mid-point, slightly falcate, narrowed to an obtuse point at the apex, entire but somewhat irregular at the margins, cuneate at the base; midrib stout, curved, prominent; secondaries relatively stout, prominent, numerous, about 12 subopposite to alternate pairs, subparallel and camptodrome, relatively straight, diverging from the midrib at an angle of about 50°; tertiaries obsolete.

This fossil species is based on two collections, one found in the Holly Springs sand at Holly Springs, Marshall County, Mississippi, by Edward Wilber Berry, and the other in the Grenada formation at Grenada, Grenada County, Mississippi, by Ephraim Noble Lowe and Edward Wilber Berry, both specimens deposited in the United States National Museum at Washington. These strata are part of the Wilcox formation of Lower Eocene age. According to Berry, the species is rare in this formation and is closely related to "C. villosum Jacq." [by which he probably means C. fruticosum L.], differing merely in its more numerous, straighter, and less ascending secondaries in the leaf-blades.

CITHAREXYLUM FLABELLIFOLIUM S. Wats., Proc. Amer. Acad. 24: 67--68. 1889.

Synonymy: Citharexylum flabelliforme S. Wats. ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. Cacocalyx flabellifolium S. Wats. ex Moldenke, Alph. List Invalid Names 7, in syn. 1942. Citharexylum flabelliformis Wats. ex Gentry, Allan Hancock Pacific Exped. 13 (2): 238, sphalm. 1949.

Literature: S. Wats., Proc. Amer. Acad. 24: 67--68. 1889; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Prelim. Alph. List Invalid Names 16. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Invalid Names 14. 1942; Moldenke, Alph. List Cit. 1: 57 & 233. 1946; Moldenke, Phytologia 2: 330. 1947; Moldenke, Castanea 13: 114. 1948; Moldenke, Alph. List Cit. 2: 331, 343, 500, 587, & 592 (1948), 3: 769, 785, & 933 (1949), and 4: 1020, 1030, 1121, 1126, 1239, 1242, 1244, 1245, & 1247. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29, 34, & 179. 1949; H. S. Gentry, Allan Hancock Pacific Exped. 13 (2): 113 & 238. 1949; Shreve & Wiggins, Carnegie Inst. Wash. Publ. 591: 88 & 95. 1951.

Stiff, stout, twiggy, and intricately though openly branched shrub, to 3 m. tall; branches and branchlets medium-slender, subterete, gray, medullose, densely canescent-puberulent with short hairs, becoming glabrate in age, marked with 4 very slender straight and parallel canaliculae arranged in opposite pairs; twigs and young shoots stout and heavy, very light-gray, more or less acutely tetragonal, densely canescent-pubescent, often spine-tipped; nodes not annulate; principal internodes 4--20 mm. long; leaf-scars small, borne on short and slender sterigmata; leaves decussate-opposite, but mostly clustered on extremely short spur-like or knob-like lateral twigs; petioles very slender, 2--4 mm. long, densely canescent-pubescent; leaf-blades thin-chartaceous, dark-green and uniformly colored on both surfaces, nigrescent in drying, flabelliform, 0.6--1.6 cm. long, 0.7--1.7 cm. wide, rounded or subtruncate in outline at the apex, acutely narrowed to the cuneate base, regularly dentate almost to the middle with broad more or less apiculate teeth, rather densely or sparsely puberulent on both surfaces, especially along the larger venation beneath; midrib slender, plane above, prominulous beneath; secondaries very slender, about 3 pairs, ascending, not at all arcuate, each ending in a tooth-apiculation; vein and veinlet reticulation indiscernible; racemes terminal or on short leafy spurs, 2.5--9 cm. long, 1--1.5 cm. wide, very loosely 5--15-flowered, the flowers distant, alternate or subopposite, often reflexed, each subtended by a comparatively large bractlet; peduncles 5--11 mm. long, canescent-pubescent; rachis similar to the twigs, canescent-pubescent; pedicels very slender, 1--2 mm. long, elongate to 4 mm. in fruit, canescent-pubescent; bractlets one subtending each flower, conspicuous, lanceolate, 3--6 mm. long, about 1.5 mm. wide, pubescent; prophylla linear, 1--3 mm. long, often several subtending each pedicel, pubescent; flowers very sweet-scented; calyx about 6 mm. long, 5-nerved and -angled, the rim acutely toothed, becoming thin and dilated and loosely enclosing the fruit; corolla dark-violet or pale-purple, about 12 mm. long, the tube yellowish, shorter than the calyx, tomentose within, the limb broadly expanded, the lobes nearly equal, rounded; fifth stamen antherous; fruiting-calyx light, thin, slightly obvolute to as to include the immature fruit, later splitting irregularly to the base as the fruit matures, sparsely puberulent in 5 parallel lines leading to the 5 apiculations, splitting between these lines where the substance becomes more scarious; fruit oblong-subglobose, 4--6 mm. long and wide, 2-lobed, glabrous, not fleshy, rugate-wrinkled and dull black in drying.

The species was based on two collections made by Edward Palmer, and both called no. 237, in mountain ravines at Guaymas, Sonora, Mexico, one in September (flowers) and the other in November (fruit) of 1887, the original cotypes deposited in the Gray Herbarium of Harvard University. The species is remarkable for its canaliculate branches, its flabelliform leaf-blades, and its extremely large flowers. The numerous spur-like twigs are also noteworthy features, possesses also, however, to greater or less degree by other small-leaved species such as C. brachyanthum (A. Gray) A. Gray. The canaliculations are distinctive of this species and offer the most reliable method of identification. It has been collected in anthesis from September through December and in March and April, and in fruit from October through December and in May. Shreve 6115 is anomalous in being bright-green on both leaf-surfaces, not having discolored at all in drying. Gentry 4721 is said to be a topotype collection, made at the type locality. Shreve 7186 exhibits 3 very fine flowers on the Shreve Herbarium specimen.

The species is said to grow in coarse calcareous soil in open mesquite grasslands of lowlands, in coarse granite sand on bluffs, and in ravines and on benches along the ocean-front. Johnston calls the fruit "more or less baccate", implying that it is fleshy when fresh, a feature not apparent on the herbarium material examined.

Curiously, this species is not listed in the "Index Kewensis" nor any of its supplements. Watson, in the original publication, apparently intended to erect a new genus for this plant, called *Cacocalyx*, since he published the name as "*Citharexylum* (*Cacocalyx*) *flabellifolium*" and commented "Differs from *Citharexylum* in foliage, in the large violet flowers, and in the calyx enveloping the fruit." He also notes that the juice of the fruit makes a persistent black stain.

In all, 43 herbarium specimens, including the types of all the names involved, and 5 mounted photographs have been examined.

Citations: MEXICO: Baja California: *Brandegee s.n.* [March 26, 1889] (Ca--169701, D, Os); *Hammerly 207* (Du--295384, Gg--294853); *D. A. Johansen 596* (Du--206490); *Nelson & Goldman 7293* (W--565380), *7347* (W--565427); *Shreve 7186* (Du--263401, F--892629, Fs); *J. Whitehead 823* (Du--248537). Sonora: *H. S. Gentry 4271* (Du--274307, Me, N); *Edw. Palmer 237* [Sept.] (B--photo of cotype, Bm--cotype, C--cotype, Cp--cotype, G--cotype, K--cotype, K--photo of cotype, N--photo of cotype, Os--cotype, Pa--cotype, S--photo of cotype, W--46917--cotype, W--1323207--cotype, Z--photo of cotype), *237* [Nov.] (B--photo of cotype, Bm--cotype, C--cotype, Cp--cotype, G--cotype, K--cotype, K--photo of cotype, N--photo of cotype, Os--cotype, Pa--cotype, S--photo of cotype, W--46917--cotype, W--1323207--cotype, Z--photo of cotype); *Shreve 6115* (F--682953, Me, N); *Wiggins 6334* (Du--244141). CARMEN ISLAND: *I. M. Johnston 3840* (Gg--31063).

CITHAREXYLUM FLEXUOSUM (Ruíz & Pav.) D. Don, Edinb. New Philos. Journ. 11 (Jan.--Mar.): 237. 1831.

Synonymy: *Rauwolfia flexuosa* Ruíz & Pav., Fl. Peruv. & Chil. 2: 26, pl. 152, fig. a. 1799. *Rauwolfia macrophylla* Ruíz & Pav., Fl. Peruv. & Chil. 2: 26, pl. 152, fig. b. 1799. *Citharexylum spinosum* H.B.K., Nov. Gen. & Sp. Pl. 2: 256. 1817 [not *C. spinosum* L., 1753]. *Citharexylon spinosum* Kunth ex Spreng., Syst. Veg., ed. 16, 2: 764. 1825. *Citharexylum retusum* D. Don, Edinb. New Philos. Journ. 11 (Jan.--Mar.): 237. 1831. *Citharexylon spinosum* H. & B. ex Steud., Nom. Bot., ed. 2, 1: 375. 1840. *Citharexylon flexuosum* D. Don ex Walp., Repert. 4: 72. 1845. *Citharexylon retusum* D. Don ex Walp., Repert. 4: 72. 1845. *Citharexylon spinosum* H.B.K. apud Walp., Repert. 4: 73. 1845. *Duranta buxifolia* Willd. ex Walp., Repert. 4: 73, in syn. 1845 [not *D. buxifolia* Poir., 1847]. *Citharexylum spinos-*

um Kunth apud Schau. in A. DC., Prodr. 11: 610. 1847. *Citharexylon megacanthum* Rusby, Bull. N. Y. Bot. Gard. 8: 115—116. 1912. *Citharexylum megacanthum* Rusby apud Prain, Ind. Kew. Suppl. 5: 60. 1921. *Citharexylum speciosum* Macbr. ex Moldenke, Prelim. Alph. List Invalid Names 17, in syn. 1940. *Marexylon quadrangulare* Zucc. ex Moldenke, Prelim. Alph. List Invalid Names 32, in syn. 1940. *Rauwolfia emarginata* Ruíz & Pav. ex Moldenke, Prelim. Alph. List Invalid Names 39, in syn. 1940. *Citharexalum spinosum* H.B.K. ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941. *Citharexylum speciosum* H.B.K. ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941. *Rauvolfia emarginata* Ruíz & Pav. ex Moldenke, Alph. List Invalid Names 40, in syn. 1942. *Citharexylum fleeuosum* (Ruíz & Pav.) D. Don ex Moldenke, Alph. List Cit. 3: 880, sphalm. 1949. *Citharexylon spinosa* H.B.K., in herb. *Rauwolfia spinosa* Ruíz, in herb. *Turncasa flexuosa* Ruíz & Pav., in herb. *Turncasa macrophylla* D. Don, in herb.

Literature: Ruíz & Pav., Fl. Peruv. & Chil. 2: 26, pl. 152, figs. a & b. 1799; Jacq., Hort. Schönbr. 4: 51, pl. 500. 1804; H.B.K., Nov. Gen. & Sp. Pl. 2: 256. 1817; Spreng., Syst. Veg., ed. 16, 2: 764. 1825; D. Don, Edinb. New Philos. Journ. 11 (Jan.—Mar.): 237. 1831; Steud., Nom. Bot., ed. 2, 1: 375. 1840; Walp., Repert. 4: 72—73. 1845; Schau. in A. DC., Prodr. 11: 610. 1847; Jacks., Ind. Kew. 1: 549 & 550. 1893; Rusby, Bull. N. Y. Bot. Gard. 8: 115—116. 1912; Prain, Ind. Kew. Suppl. 5: 60. 1921; Moldenke in Fedde, Repert. 37: 222—223. 1934; Moldenke, Alph. List Common Names 31. 1939; Moldenke, Geogr. Distrib. Avicenn. 23 & 36. 1939; Moldenke, Prelim. Alph. List Invalid Names 15, 17, 25, 32, & 39. 1940; Moldenke, Suppl. List Invalid Names 2. 1941; Moldenke, Alph. List Invalid Names 13, 15, 23, 33, & 40. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34, 71, & 88. 1942; Bol. Mus. Hist. Nat. Jav. Prado 7: 245. 1943; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 50, 118, 243, & 317 (1946), 2: 338, 344, 347, 357, 407, 408, 434, 459, 530, 560—562, 566, 573, 581, & 611. 1948; H. N. & A. L. Moldenke, Plant Life 2: 44. 1948; Moldenke, Alph. List Cit. 3: 686, 691, 694, 697, 713, 801, 838, 850, 880, 881, & 957 (1949) and 4: 1016, 1020, 1046, 1060, 1112, 1134, & 1232. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 71, 157, & 179. 1949; Moldenke, Rev. Sudam. Bot. 8: 173. 1950.

Illustrations: Ruíz & Pav., Fl. Peruv. & Chil. 2: 26, pl. 152, figs. a & b. 1799; Jacq., Hort. Schönbr. 4: pl. 500. 1804.

Low, spreading, very spiny shrub or small tree, to 7 m. tall; branches and branchlets medium or stout, gray or brown, often very shiny, woody, obscurely and minutely puberulent on the younger parts, soon becoming glabrous, rather indistinctly and obtusely tetragonal or sometimes very acutely so and several-ribbed, often slightly flattened and ampliate at the nodes, well-armed with short, stout, lateral, axillary branchlets which are modified into spines 0.7—5 cm. long, sharp at the apex, broad at the base, sometimes 2-branched with each branch also spinescent, glabrous, shiny, sometimes becoming leaf- and raceme-bearing and in such cases usually spinescent at every node; short lateral twigs and shoots borne in a secondary-axillary manner and apparently issuing from the adaxial side of the sterigmata after the leaf has fallen therefrom, mostly racemiferous; nodes annulate; principal internodes 0.5—3.5 cm. long; leaf-scars borne on large, prominent, ascending, corky sterigmata 1.5—3.5 mm. long; leaves decussate-opposite, mostly confert on the short axillary and secondary-axillary branchlets and twigs; petioles slender, 3—15 mm. long, pubescent; leaf-blades membranous, dark-green on both surfaces or slightly lighter beneath, oblong or elliptic or slightly obovate, 2.2—5.8 cm. long, 0.7—3 cm. wide, obtusely rounded or subemarginate at the apex, entire or very sparingly subserrate along the upper margin, acute or subcuneate at the base, sparsely short-pubescent or puberulent (especially along the midrib) above, becoming glabrate, densely short-pubescent beneath; midrib slender, plane or subimpressed above, prominent beneath; secondaries very slender, 5—7 pairs, ascending, somewhat arcuate, not anastomosing, plane or subimpressed above, prominulous beneath; vein and veinlet reticulation fine, often subimpressed above and prominulous beneath; racemes numerous, terminating short secondary-axillary branchlets and twigs, 1.5—2.5 cm. long, few-flowered; peduncles slender, 2—5 mm. long, pubescent; pedicels filiform, about 1 mm. long, pubescent, elongated to 2 or 2.5 mm. in fruit; bracts and bractlets apparently none; prophylla setaceous or linear, about 1 mm. long, not obvious; flowers very fragrant; calyx campanulate or tubular-campanulate, membranous, pentagonal, 5-nerved, pubescent, its rim obtusely 5-dentate; corolla varying from white, dirty-white, or creamy-white to yellowish-white, greenish-cream, or even pale-yellow or yellowish, in all about twice as long as the calyx, waxy, the tube subequaling or shorter than the calyx, the throat villous, the limb 5-lobed, villous, the lobes spreading, equal, subrotund, densely hairy on the inner surface with white hairs, violet externally; stamens 4 or 5, equal, subincluded; filaments very short; anthers sagittate, waxy, 2-celled; style included; stigma subcapitate; ovary subglobose, 2-celled, the placentation axile; fruiting-calyx cupuliform, eventually almost patelliform, 2.5—3 mm. long, 4—6.5 mm. wide, densely puberulent, its rim at first suntruncate and entire, eventually splitting into 5 rounded lobes 1.5—2 mm. long; fruit purplish-black or black, oblong or subglobose, about 8 mm. long, 7—8 mm. wide, fleshy, 2-lobed, glabrate; seeds 2, obovate, convex externally, concave internally, 2-celled.

The type of this species was apparently collected from cultivated material growing in the botanical garden at Madrid, Spain, grown there from seed sent by Hipólito Ruíz from Huanuco, Quivilla, and Huariaca, in the department of Huanuco, Peru. C. spinosum was based on a collection made by Friedrich Heinrich Alexander von Humboldt and Aimé Jacques Alexandre Bonpland (No. 3687) on the Paramo of Yanaguanga, at an altitude of 1500 hex., and another made in the valley of Cajamarca, Peru. The type of Rauwolfia macrophylla was collected by Juan Tafalla on sandy hills near Arequipa, Peru. The type of Citharexylon megacanthum was collected by Robert Statham Williams (no. 2544) on the hills in back of Mollendo, Arequipa, Peru, at an altitude of 2000 feet, on August 5, 1901, and is deposited in the Britton Herbarium at the New York Botanical Garden.

The exceptionally large and stout spines of this species render its identification easy. It is most unfortunate that the two very appropriate specific epithets, "spinosum" and "megacanthum", are invalid, and that such a singularly inappropriate one as "flexuosum" should be the valid one, while "spinosum" is applied to a non-spiny species! In some specimens the internodes on the abbreviated secondary-axillary branchlets are so short that the leaf-sterigmata overlap each other closely! The mature leaves almost invariably have the midrib, secondaries, and veinlet reticulation impressed above, while immature leaves have them plane above. Macbride describes the flowers as being very fragrant. The species ascends from 800 to 2850 meters altitude and is said to inhabit rocky places, hillsides and steep stony hillsides, gravelly soil, dry gravelly slopes, heavy loam soil, steep rock slides, very steep quebradas, and the banks of rivers. It has been collected in anthesis from July through October, and in fruit in April and May. It has been confused by Raimondi with the genera Randia Houst. and Duranta L., and by Kummer with "Cinchona jacquini", "Plectronia detonsa", and Citharexylum molle H.B.K. I. M. Johnston confused it with Duranta triacantha A. L. Juss., and Standley with D. armata Moldenke. It has also been confused in herbaria with Citharexylum pentandrum Vent. and "Citharexilon cinereum L." [=Citharexylum fruticosum L.]

A specimen in the Kew herbarium, apparently representing the same plant or a plant from the same lot of seeds as that described and figured by Jacquin in Hort. Schönbr. 4: 51, pl. 500 (1804), has been examined by me. It is a perfect match for the illustration of Jacquin and certainly represents this species. Jacquin states that the plant grew from seeds collected on the Champion River in Patagonia (a river not as yet located by me on any atlas of the area). The specimen in question was grown in the Jardin des Plantes, Orangerie, under the name of "Duranta spinosa", and was collected on June 26, 1819. If the seeds of this plant actually came from Patagonia, it would indicate a most remarkable extension of the range of the species. Examination of the type and several isotypes of the Humboldt, Bonpland, and Kunth plant leaves no doubt whatever that it is identical with the Ruiz and Pavon plant. In all, 65 herbarium specimens, including the types of all the names involved, and 23 mounted photographs have been examined.

Vernacular names for the species are "chama", "choloquillo simarrón", "spino de cruzes", and "turucasa" — the last-mentioned name signifying blunt spines. Walpers and Schauer, in the references cited above, both incorrectly cite the D. Don binomial to page "273" instead of "237" of the New Philosophical Journal. The formal labels accompanying the Macbride photograph of an isotype of C. spinosum H.B.K. read "Citharexylum speciosum" in error. In the Bol. Mus. Hist. Nat. Jav. Prado reference given above Raimondi cites his no. 12031 from Lima as this species. I have not seen any material of this number, but have seen no. 12037, from Ancash. Possibly a typographic error is involved here.

The so-called variety subglabrum Moldenke, proposed by me in Fedde, Repert. 37: 222--223 (1934), proves to belong to the solanaceous genus Lycium and is now known as Lycium subglabrum (Moldenke) Moldenke.

Citations: PERU: Ancash: Raimondi 12037 (B). Arequipa: D. Stafford 822 (K); Weberbauer 1450 (B); R. S. Williams 2544 (B--photo, Bm, K, K--photo, N, N--photo, S--photo, Z--photo); Worth & Morrison 15700 (Ca--656626). Cajamarca: Humboldt & Bonpland 3687 [Macbride photos 17601] (B, B, E--photo, F--976582, F--photo, Kr--photo, N--photo, N--photo, N--photo, P, P, P, S--photo, W--photo, Z--photo, Z--photo); Raimondi 3206 (B), 3951 (B), 7537 (B). Huanuco: Macbride & Featherstone 2279 (F--518762, W--1123158), 2409 (F--518844, N--photo, S, W--1123165, Z--photo), 2438 (F--518872, K, N, N, S, W--1123166), 3173 (F--534243); A. Mathews 825 (Ed, K); Ruíz s.n. [Rauwolfia emarginata] (B, Bm); Ruíz & Pavon 88 [7/78; Macbride photos 29685] (F--918369, Kr--photo, N--photo, Q), 841 [8/41] (F--842506, F--845360); Stork & Horton 9398 (Ca--647462); United States Expl. Exped. [Wilkes] s.n. [Baños] (W--57341). Lima: Macbride & Featherstone 464 (F--516998, W--1123118); Nuñez 3151 (W--2120751); Raimondi 12014 (B); Weberbauer 98 (B). CULTIVATED: Austria: Hort. Schönbr. s.n. [Patagonia] (V, V). France: Collector undesignated s.n. (Dc, Dc, Dc, Dc); Gouan s.n. (K); Herb. Harvey s.n. [Jardin du Montpellier] (Du--166406); Hort. Audibert s.n. (K); Hort. Bot. Monspel. s.n. [1816] (L); Jard. Pl. Oranger. s.n. [26 Juin 1819] (K); Reynier s.n. [1826] (Dc). Germany: Herb. Kummer s.n. [Hort. Bot. Monac., 1832] (Mu--1380), s.n. [Hort. Bot. Monac., 1840] (Mu--1381); Herb. Zuccarini s.n. [Hort. Bot. Monac., 1834] (Mu--1384); Hort. Berol. s.n. [April, 1846] (B). Italy: Jard. de Florence s.n. (Cb). Madagascar: Goudot s.n. [Madag.] (P). Netherlands: Herb. Persoon s.n. (Le). Spain: Pavon s.n. (X--isotype); Ruíz s.n. [Rauwolfia flexuosa] (B--isotype, Bm--isotype, K--photo of isotype, N--photo of isotype, S--photo of isotype, Z--photo of isotype).

CITHAREXYLUM FORSITHIAEFOLIUM Massalongo, Syllabus Plant. Foss. 72, nom. nud. [as "Citharexylon forsithiaefolius"]. 1859;

Moldenke, Geogr. Distrib. Avicenn. 41, nom. nud. 1939.

Synonymy: Citharexylon forsithiaefolium Massalongo ex Moldenke, Prelim. Alph. List Invalid Names 15, in syn. 1939.

Literature: Massalongo, Syllabus Plant. Foss. 72. 1859; Moldenke, Geogr. Distrib. Avicenn. 41. 1939; Moldenke, Prelim. Alph. List Invalid Names 15. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 88. 1942; Moldenke, Alph. List Invalid Names 13. 1942; H. N. & A. L. Moldenke, Plant Life 2: 42. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 166 & 179. 1949.

Nothing is known of this fossil species except that it is based on a specimen from the Chiavon formation at Venice, Italy, of Oligocene age. No formal description or illustration seen to have ever been published.

CITHAREXYLUM FRUTICOSUM L., Syst. Nat., ed. 10, 2: 1115 [as "fruticos."]. 1759; Sandm., Fl. Jamaic. 18, nom. nud. [as Citharexylon fruticosum]. 1759; O. E. Schulz in Urb., Symb. Ant. 6: 61. 1909.

Synonymy: Citharexylon arbor americana, foliorum venis late candicantibus Pluk., Phytogr. 3: pl. 162, fig. 1. 1692. Citharexylum arbor laurifolia, americana, foliorum venis late candicantibus Pluk., Almag. Bot. 108. 1696. Citharexylon fruticosum, cortice cinereo, foliis oblongo-ovatis oppositis, petiolis marginatis pedatis, floribus spicatis, fructu majori P. Browne, Civil & Nat. Hist. Jamaic., ed. 1, 264. 1756. Citharexylon cinereum L., Sp. Pl., ed. 2, 2: 872. 1763 [not C. cinereum Spreng., 1851]. Citharexylum cinereum L., Syst. Nat., ed. 12, 416. 1767. Cytharexylum cinereum L. ex Jacq., Amer. Gew. 2: 44. 1787. Citharexylum coriaceum Desf., Tabl. Ecol. Bot., ed. 2, 65, nom. nud. (1815), Cat. Pl. Hort. Reg. Paris, ed. 3, 91 & 392. 1829. Citharexylon coriaceum Desf. ex Steud., Nom. Bot., ed. 1, 202. 1821. Citharexylum fruticosum, cortice cinereo etc. P. Browne apud Walp., Repert. 4: 75, in syn. 1845. Citharexylon arbor laurifolia Pluk. apud Walp., Repert. 4: 75, in syn. 1845. Citharexylum cinereum Sessé & Moc. ex D. Don, Edinb. New Philos. Journ. 11 [Jan.—Mar.]: 238, in syn. (1831); Sessé & Moc., Fl. Mex., ed. 1, 152. 1894. Citharexylum caudatum Sagra apud O. E. Schulz in Urb., Symb. Ant. 6: 61, in syn. 1909 [not C. caudatum L., 1763]. Citharexylum quadrangulare Griseb., in part, apud O. E. Schulz in Urb., Symb. Ant. 6: 62, in syn. 1909 [not C. quadrangulare L., 1786, nor Schau., 1864, nor Sessé & Moc., 1894, nor Millsp., 1907, nor Boutelou, 1909, nor Jacq., 1909, nor A. Rich., 1909, nor Hort., 1911, nor Hort. Madrit., 1806, nor Citharexylon quadrangulare Jacq., 1760]. Citharexylum villosum Griseb. apud O. E. Schulz in Urb., Symb. Ant. 6: 62, in syn. 1909 [not C. villosum Jacq., 1781]. Citharexylum villosum Chapm. apud Small, Fl. Miami 161, in syn.

1913. *Citharexylon fruticosum* L. apud Sudw., Check List For. Trees U. S. 231. 1927. *Citharexylum spicatum* Ryan ex Moldenke, Prelim. Alph. List Invalid Names 17, in syn. 1940 [not *C. spicatum* (Jacques) Sprague, 1924, nor *Citharexylon spicatum* Rusby, 1900]. *Citharexylum villosum* var. *glaberrimum* C. Wright ex Moldenke, Prelim. Alph. List Invalid Names 18, in syn. 1940. *Cytharexilum cinereum* Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 24, in syn. 1940. *Atharexylum cinereum* L. ex Moldenke, Suppl. List Invalid Names 1, in syn. 1941. *Citarexylum fruticosum* L. apud Alain in León & Alain, Fl. Cuba 4: 299 & 300, sphalm. 1957. *Citarexylum fruticosum* var. *fruticosum* [Alain] in León & Alain, Fl. Cuba 4: 300. 1957. *Citarexylum cinereum* L. apud Alain in León & Alain, Fl. Cuba 4: 300, in syn. 1957. *Atharexylon cinereum* L., in herb.

Literature: Pluk., Phytogr. 3: pl. 162, fig. 1. 1692; Pluk., Almag. Bot. 108. 1696; L., Amoen. Acad. 1: 406. 1749; P. Browne, Civil & Nat. Hist. Jamaic., ed. 1, 264. 1756; Plum., Pl. Amer., ed. Burm., pl. 157, fig. 2. 1758; L., Syst. Nat., ed. 10, 2: 1115. 1759; Jacq., Enum. Syst. Pl. Carib. 26. 1760; L., Syst. Nat., ed. 11, 2: 1115. 1760; L., Amoen. Acad. 5: 380. 1760; L., Sp. Pl., ed. 2, 2: 872. 1763; L., Sp. Pl., ed. 3, 2: 872. 1764; L., Syst. Nat., ed. 12, 416. 1767; L., Syst. Nat., ed. 13, 416. 1770; Murr. in L., Syst. Veg., ed. 13, 472. 1774; Jacq., Select. Stirp. Amer. Hist. Pict. 90—91, fig. 178. 1780; Murr. in L., Syst. Veg., ed. 14, 564. 1784; Jacq., Amer. Gew. 2: 44, pl. 197. 1787; Gmel., Syst. Nat. 2 (2): 942. 1788; Jacq., Ic. Pl. Rar. 3: pl. 501. 1793; Gmel. in L., Syst. Nat., ed. 13, 2 (2): 942. 1796; Desf., Tabl. Ecol. Bot., ed. 1, 54. 1804; Desf., Tabl. Ecol. Bot., ed. 2, 65. 1815; Poir. in Lam., Dict. Sci. Nat. 9: 284—285. 1817; Cels, Cat. Arbres 11. 1817; Steud., Nom. Bot., ed. 1, 202. 1821; Mordant de Launay, Herb. Amat. 7: pl. 493. 1824; Desf., Cat. Pl. Hort. Reg. Paris, ed. 3, 91 & 392. 1829; Drapiez, Herb. Amat. Fl. 4: pl. 269. 1830; Richter, Linn. Op. 603. 1835; Richter, Cod. Linn. 603. 1840; Steud., Nom. Bot., ed. 2, 375. 1840; Walp., Repert. 4: 75. 1845; Schau. in A. DC., Prodr. 11: 611 & 613. 1847; Schau. in Mart., Fl. Bras. 9: 267. 1851; Griseb., Abhand. König. Gesell. Wissen. Götting. 7: 256. 1857; Ettingsh., Blatt-Skel. Dikot. 78, fig. 42. 1861; Griseb., Fl. Brit. W. Ind. 497. 1861; Fawcett, Prov. List Indig. Nat. Fl. Pl. Jamaic. 29. 1893; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 159. 1894; Sessé & Moc., Fl. Mex., ed. 1, 152 (1894), ed. 2, 166. 1895; Lubbock, Journ. Linn. Soc. Lond. Bot. 33: 231. 1897; Børgesen, Bot. Tidsskr. 22: 79. 1898; Boergesen & Paulsen, Rev. Gén. Bot. 12: 443. 1900; Contrib. U. S. Nat. Herb. 8: pl. 27. 1903; Pulle, Enum. Pl. Surin. 403. 1906; Avebury, Buds & Stipules 76. 1908; Britton, N. Am. Trees 825. 1908; O. E. Schulz in Urb., Symb. Ant. 6: 61—62. 1909; Small, Fl. Miami 161. 1913; Small, Fl. Fla. Keys 130. 1913; Ann. Rep. Smithson. Inst. 1917: 383. 1918; Britton & Millsp., Bahama Fl. 371—372. 1920; Sarg., Man. Trees N. Amer., ed. 2, 865. 1922; Britton & P. Wils., Scient.

Surv. Porto Rico 6: 145—146. 1925; León in Shelford, Naturalists Guide Amer. 687. 1926; Sudw., Check List For. Trees U. S. 231. 1927; Roig, Est. Exp. Agron. Santiago Vegas Bol. 54: 340, 558, & 793. 1928; Seymour, Host Ind. Fungi N. Am. 588—589. 1929; Stapf, Ind. Lond. 2: 220. 1930; Small, Addisonia 15: pl. 496. 1930; Trop. Woods 27: 27. 1931; Grey & Hubbard, List Pl. Atkins Instit. 56. 1933; Small, Man. Southeast. Fl. 1142. 1933; J. A. Harris, Physico-chem. Prop. Plant Saps 143. 1934; Wolcott & Otero, Journ. Agr. Univ. Puerto Rico 20: 99, 103, 104, 128, 143, 463, 467, 499, & 607. 1936; Apolinar Maria, Revist. Acad. Colomb. 1: 358. 1937; Moldenke, Annot. List 108. 1939; Moldenke, Lilloa 4: 310—311. 1939; Moldenke, Alph. List Common Names 2, 4—8, 10, 12—14, 20, 23—27, & 33. 1939; Moldenke, Geogr. Distrib. Avicenn. 3—12, 20, 21, & 36. 1939; Moldenke, Suppl. List Common Names 7, 9, 13, 16—18, & 21. 1940; Moldenke, Prelim. Alph. List Invalid Names 15—18 & 24. 1940; Moldenke, Suppl. List Invalid Names 1. 1941; Worsdell, Ind. Lond. Suppl. 1: 233. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 4, 24—30, 32, 33, 71, & 88. 1942; Moldenke, Alph. List Invalid Names 4, 13—15, & 23. 1942; J. H. Davis, Fla. Geol. Surv. Bull. 25: 173. 1943; Moldenke, Phytologia 2: 96. 1944; Moldenke, Am. Midl. Nat. 32: 575. 1944; Buswell, Native Trees & Palms 44. 1945; Little, Am. Midl. Nat. 33: 512. 1945; Moldenke, Castanea 10: 37. 1945; Alain, Contrib. Ocas. Mus. Hist. Nat. Coleg. La Salle 7: 79 & 113. 1946; Augusto, Fl. Rio Grande do Sul 229 & 236. 1946; Menninger, 1947 Cat. Flow. Trees 37. 1946; E. S. & J. G. Harrar, Guide South. Trees 648—649, pl. 192. 1946; Gregory & Vélez, Caribb. Forester 7: 16, 20, 22, & 33. 1946; Moldenke, Alph. List Cit. 1: 2, 22, 23, 33, 37, 50, 55, 61—70, 74, 75, 80, 98, 99, 113, 115, 129, 138, 139, 155, 162, 176, 180, 181, 185, 187, 189, 196, 197, 201, 208, 211, 216, 221, 241, 247, 250, 258—260, 269—272, 280—282, 292, 295, 298, 301, 302, 304—307, 309—314, 320, & 321. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 5. 1947; Moldenke, Alph. List Cit. 2: 332, 333, 335, 339, 345, 356, 393—395, 403, 408, 409, 420, 422-429, 433, 435—437, 443, 446, 447, 459, 465, 468, 475, 481, 487, 490, 496, 499, 502, 509, 511, 512, 518, 521, 528, 535, 543, 544, 549, 564—566, 570, 577, 578, 579, 593, 609, 621, 625, 646, & 648 (1949), 3: 653, 654, 675, 706, 713, 718, 728, 742, 755, 756, 758—760, 771, 774—776, 778, 782, 795, 801, 822, 824, 825, 828, 842, 847, 852—854, 856, 858, 866, 868, 871, 880, 887—889, 891, 892, 894, 897, 916, 917, 926, 928—930, 937—939, 941, 944, 949, 958, & 969—971 (1949), and 4: 983, 986, 995, 1012, 1016—1020, 1022—1027, 1033—1035, 1037, 1039—1042, 1045, 1047, 1050, 1054, 1057, 1062, 1063, 1065, 1066, 1068, 1103, 1117, 1136, 1137, 1139, 1145, 1192, 1206, 1208, 1220, 1296, & 1303. 1949; W. L. Phillips, Cat. Fairchild Trop. Gard. 16. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 9, 42, 43, 46, 47, 49—57, 62, 67, 157, & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Menninger, Winter 1950 Seed List n.p. 1950; Moldenke, Phytologia 3: 451. 1951; Roig, Dicc. Bot. 1: 441—442, 476—477, 636, 759, 824, 826—828, & 850 and 2: 1003. 1953; Moldenke, Journ. Calif. Hort. Soc. 15: 80. 1954; Moldenke in Cheesman, Fl. Trin. & Tob. 2 (6): 19—23. 1955; Alain in León & Alain, Fl. Cuba 4: 299—300, fig. 129. 1957.

Illustrations: Pluk., Phytogr. pl. 162, fig. 1. 1692; Plum., Pl. Amer., ed. Burm., pl. 157, fig. 2 [as C. caudatum]. 1758; Jacq., Select. Stirp. Amer. Hist. Pict. 90—91, pl. 178 (colored). 1780; Jacq., Ic. Pl. Rar. 3: pl. 501 [as C. erectum]. 1793; Mordant de Launay, Herb. Amat. 7: pl. 493 (colored). 1824; Drapiez, Herb. Amat. Fl. 4: pl. 269 (colored). 1830; Ettingsh., Blatt-Skel. Dikot. 78, fig. 42. 1861; Lubbock, Journ. Linn. Soc. Lond. Bot. 33: 231 [as C. quadrangulare]. 1897; Børgesen, Bot. Tidsskr. 22: 79, fig. 28 (8). 1898; Rev. Gén. Bot. 12: 443. 1900; Contrib. U. S. Nat. Herb. 8: pl. 27 [as C. quadrangulare]. 1903; Avebury, Buds and Stipules 76 [as C. quadrangulare]. 1908; Britton, N. Am. Trees 825. 1908; Ann. Rep. Smithson. Instit. 1917: 383. 1918; Sarg., Man. Trees N. Amer., ed. 2, 865. 1922; Small, Addisonia 15: pl. 496 (colored). 1930; Small, Man. Southeast. Fl. 1142. 1933; E. S. & J. C. Harrar, Guide South. Trees pl. 192. 1946; Alain in León & Alain, Fl. Cuba 4: fig. 129. 1957.

Shrub or graceful, slender, semi-deciduous, small, or medium sized tree, to 16 m. tall; trunk to 21 cm. in diameter at breast height; branches medium-stout, gray, obtusely or more or less acutely tetragonal, glabrous; bark on old trees pale-brown or gray, smooth or with very shallow furrows, on young trees light-brown; branchlets more slender, acutely tetragonal, often ribbed; twigs and young shoots light-brown, acutely tetragonal, medullose, glabrous, often ribbed; nodes annulate; principal internodes 0.7—5.8 cm. long; leaf-scars borne on stout ascending sterigmata, which on larger branches become very corky and to 5 mm. long and 4 mm. wide; leaves decussate-opposite; petioles slender or stoutish, orange when fresh, 1—2.5 cm. long, more or less margined, canaliculate above, glabrous; leaf-blades very firmly chartaceous, bright- or yellow-green on both surfaces or somewhat darker above, very shiny and glossy (especially above), oblong or elliptic (occasionally sublanceolate, oblanceolate, or obovate), 4.5—21 cm. long, 1.5—8 cm. wide, varying from acute or very shortly acuminate to obtuse or rounded at the apex (rarely emarginate), entire (or coarsely serrate on seedlings), cuneate or narrow-cuneate at the base, with 1—3 pairs of glands at the very base, one pair of which is always much elongated and parallel to the petiole, reticulate, very glabrous on both surfaces or very rarely punctate beneath and obsoletely puberulent along the venation when immature, the younger ones appearing as though varnished; midrib rather stout and broad, pale, sharply prominulous above, prominent beneath; secondaries slender, 5—8 pairs, arcuate-ascending, usually hardly at all or very obscurely anastomosing, sharply prominulous on both surfaces; vein and veinlet reticulation fine, abundant, sharply prominulous on both surfaces, especially above; racemes axillary and terminal, mostly terminal, 3.5—26.5 cm. long, 1—1.7 cm. wide, the axillary ones usually abbreviated, the terminal ones sometimes branched with 1 or 2 short branches near the base, mostly lax, nutant or pendent, many-flowered, often dense; peduncles slender, brown, 0.5 to 1.5 cm. long, glabrous; rachis slender, brown, glabrous; pedicels filiform, to 1 mm. long or obsolete, glabrate; bracts and bractlets apparently none or occasionally 1 pair of linear bractlets to 3 mm. long and sparsely pubescent; prophylla linear or setaceous, 1—2 mm. long; flowers fragrant; calyx cyathiform, 2.5—4 mm. long, glabrous, its rim truncate or very lightly 5-repand-dentate and ciliate; corolla white or greenish white, subhypocrateriform, its tube 2—6 mm. long, glabrous externally, villous within (especially at the mouth), its limb 5-parted, about 5 mm. wide, the lobes suborbicular or elliptic-lingulate, 2—3 mm. long, rounded at the apex; fruiting-calyx indurated, shallowly cupuliform, 2—3 mm. long, 5—6 mm. wide, glabrous, its rim shallowly and more or less irregularly scarious-lobed; fruit oblong or subglobose, fleshy, to 13 mm. long and 12 mm. wide, apiculate by the persistent style when immature, much wrinkled in drying, dull or subnitid, 2-lobed, varying from pink or red to orange, orange-red, or scarlet when immature, purplish or black when ripe; seeds 2, thin, saucer-shaped.

The type of this very common species was collected by James Reed in the Barbados and is deposited in the Sloane Herbarium. The species inhabits roadsides, hammocks, oak hammocks, sand ridges and dunes bordering the sea, thickets, pastures, arroyos, dry thickets and woodlands, rocky shores, arid plains, forests and areas of second-growth, coastal thickets, hills and open hillsides, the borders of mangrove swamps, streamsides, riverbanks, dry copses, rocky woods, pinelands, limestone soil, limestone cliffs, coastal scrub, litoral situations, and sea islands. It ascends from sea-level to 500 meters altitude. In Florida it inhabits both the everglade keys and the Florida keys. In the West Indies it is said to be found on even the smallest sea islets. The Leonards report that it is at times scandent. Many observers report that the fruit is at first red and then turns black as it matures. Longitudinal and transverse sections of the wood may be seen on *Leonard & Leonard 11308* in the United States National Herbarium, while the *Nash 30* specimen at Chicago has sections of the bark. The *O'Neill s.n.* from Miami, collected on July 22, 1929, is accompanied by a photograph.

The branches and branchlets of this species, although light in color, are not as distinctly white as are those of *C. albicaule* Turcz. Its prominulous, dense, and conspicuous leaf-venation distinguishes it at once from *C. caudatum* L., with which it has in the past been abundantly confused by writers and herbarium workers. *C. caudatum* also has much longer racemes and more shiny fruit. Our species is much more easily confused with *C. spinosum* L., and, indeed, some specimens are distinguished with great difficulty. Poiret distinguishes the two species by noting that *C. spinosum* (which he calls *C. quadrangulare*) "differe peu du precedent. Ses feuilles sont ovalesacuminées, tres-entières; les épis pendens; les calices tronqués.....C'est le Citharexylum caudatum, de Swartz. Prodr." Schulz says that in C. fruticosum the pedicels are only 0.5—0.75 mm. long during anthesis, while in C. spinosum they are 1 to 1.5 mm. long during anthesis. In my experience, the character which is most dependable is that of the vein and veinlet reticulation. In C. fruticosum it is very conspicuous and prominent on both leaf-surfaces and the blades are mostly quite thick and firm; in C. spinosum it is usually plainly visible, but only very slightly if at all prominulous on both surfaces and the blades are often very thin and fragile. C. fruticosum may in general be distinguished from its close relatives by the following combination of characters: the calyx-rim is irregularly lobed, the pedicels are short, and the leaf-blades are firm and prominently veined.

Other species with which C. fruticosum has been confused in herbaria are C. villosum Jacq. [=C. fruticosum var. villosum (Jacq.) O. E. Schulz], C. tristachyum Turcz., C. lucidum Schlecht. & Cham., C. quadrangulare Jacq. [=C. spinosum], C. bahamense Millsp. [=C. fruticosum var. villosum], C. subserratum Sw. [=C. fruticosum var. subserratum (Sw.) Moldenke], C. erectum Sw. [=C. caudatum], and C. reticulatum H.B.K. It has also been misidentified as "Coccoloba sp.", Coccoloba diversifolia Jacq., and Borbonia Plum. M. Laurent, on the label of his collection no. 1283, gives the name C. fruticosum as a synonym of Duranta plumieri Jacq.!

Menninger refers to the inflorescences as being "spikes" and to the flowers as "tubular", but neither statement is correct. He says that the fruit is "black-and-red", but probably means that there are some red and some black fruits in the same raceme. He recommends the tree for exposed situations and states that it adapts itself to dry soils. The flowers usually blacken in drying. Britton reports the bark as shredding. Abbott states that the plant has medicinal properties. The Howards report that in the Dominican Republic it is used for living fenceposts, while Beard says that on Jost Van Dyke Island it is used for charcoal. The Howards describe it as a 7—10-foot tall "bush". Allard says it is "like Prunus serotina" in habit.

Mostly it is only a tall shrub, but when it grows into a tree it is quite slender. The very old leaves from older branches are often subcoriaceous. Broadway reports that the bark of the trunk is gray in color and falls off in shields, and that the fruit is soft, juicy, and 2-seeded. The Smiths state that "the lower blades in small plants are obscurely dentate. Petioles at base red. Flowers to some extent through the year." Britton & Cowell 1968 is such a seedling specimen and exhibits the coarsely serrate leaves not seen on ordinary specimens. Hioram 3956 is anomalous in its extremely narrow leaf-blades, which are 2.7—6.9 cm. long and 7—12 mm. wide. It approaches var. smallii Moldenke in this respect. Rehder 894 is somewhat anomalous in that the vein and veinlet reticulation is hardly at all prominulous above. Very immature leaves of this collection are membranous and have the venation plane throughout. It greatly resembles *xC. hybridum* Moldenke. The unnumbered Garber specimen, collected at Miami, Feb.—July 1877, deposited in the University of Vermont herbarium, has some hairs along the midrib.

The species has been collected in anthesis from July through February and in April and May, and doubtless blooms all through the year, as stated by the Smiths. It has been collected in fruit in every month of the year. The physico-chemical properties of the sap in relation to phytogeography are discussed by J. A. Harris in the reference cited above. Specimens which he used in his experiments were from Sykes Hammock, Brickell Hammock, Hattie Bauer Hammock, from along the shores and on scrub-covered sand dunes on the mainland side of Hobe Sound, a few miles north of Jupiter Inlet, and in Royal Palm Hammock, Florida.

Common names recorded for the species include "agracejo", "aschgrauer Geigenholzbaum", "balsamo", "balsamo", "black fiddlewood", "bois de guitard", "bois de guitare", "bois guitarin", "canilla de venado", "canilla de vendado", "catcycillo", "cateycillo", "citharexylum cendré", "cutlet", "fairytree", "falo blanco", "fiddlewood", "fiddle-wood", "fiddlewood-tree", "Florida fiddlewood", "gallito", "grenad marron", "guairo sando de costa", "guairo santo", "guayo", "guayo blanco", "guayo roble", "higuerillo", "long Tom", "mangle de sabana", "old woman's bitter", "old-woman's bitter", "palo de guitarra", "palo guitana", "palo guitarra", "penda", "penda blanca", "pender", "péndola", "pendu", "pendula", "pendúla", "péndula", "péndulo colorado", "pfndula" [error for "pendula"], "pindoula", "pindula", "racemose fiddlewood", "roble amarillo", "roble blanco", "roble de olor", "roble dulce", "roble guayo", "sangre de doncella", "savanna-wattle", "spicate fiddlewood", "susanna tree", and "white fiddlewood". Many of these names, however, are also applied to other species, sometimes quite unrelated to this one. For instance, "agracejo" is applied also to *C. dawei* Moldenke and to *C. tristachyum* Turcz.; "black fiddlewood" to *Vitex divaricata* Sw.; "bois de guitare", "bois guitarin", and "susanna tree" to *C. spinosum*; "cateycillo" and "gallito" to *C. fruticosum* var. *subvillosum* Moldenke; "cutlet" to *C. fruticosum* var. *brittonii* Moldenke, *C. fruticosum* var. *villosum*, and *C. spinosum*; "fiddlewood" to *C. fruticosum* var. *brittonii*, *C. fruticosum* var. *villosum*, *C. spinosum*, *Cornutia pyramidata* L., *Petitia domingensis* Jacq., *Vitex gaumeri* Greenm., and *V. umbrosa* Sw.; "fiddlewood" and "guairo sando de costa" to *C. caudatum*; "guairo santo" to *C. caudatum* and *Aegiphila elata* Sw.; "guayo" to *C. discolor* Turcz., *Petitia domingensis*, *Sloanea curatellifolia* Griseb. (*Elaeocarpaceae*), and *Terminalia chicharronia* Wright (*Terminaliaceae*); "guayo blanco" to *C. spinosum*, *C.*

tristachyum, and Banara roigii P. Wils. (Flacourtiaceae); "guayo roble" to C. tristachyum; "higuerillo" to C. caudatum and Vitex divaricata; "penda" to C. caudatum, C. fruticosum var. subvillosum, C. fruticosum var. villosum, C. spinosum, Cornutia pyramidata, and Chimarrys cymosa Jacq. (Rubiaceae); "roble guayo" to C. tristachyum, Clerodendrum lindeniamum A. Rich., Petitia domingensis, Vitex divaricata var. cubensis Urb., and Terminalia chicharronia; "white fiddlewood" to C. caudatum, C. fruticosum var. brittonii, C. fruticosum var. villosum, Vitex capitata Vahl, and V. compressa Turcz.; "roble blanco" to C. caudatum and Tabebuia angustata Britton (Bignoniaceae); and "roble de olor" to Catalpa macrocarpa (A. Rich.) Ekm. (Bignoniaceae), Bourreria succulenta Jacq. (Ehretiaceae), Tabebuia leptopoda Urb. (Bignoniaceae), Petitia domingensis, Vitex divaricata, Ehretia tinifolia L. (Ehretiaceae), and Sebesten sp. (Ehretiaceae).

The type of Sessé and Mociño's Citharexylum cinereum, which was their no. 2370 in Standley's recent numbering, was collected in Puerto Rico. The name "pfendula" recorded by Britton & Wilson in Scient. Surv. Porto Rico 6: 146 (1925) is surely a typographic error for "pendula". The Citharexylon cinereum L. cited by Augusto in his Flora Rio Grande do Sul 236 (1946), based on an Emrich collection and which he says is this species or some species related to this one not mentioned in Martius' Flora Brasiliensis, is certainly not C. fruticosum. It may possibly be C. rigidum (Briq.) Moldenke. Augusto lists Citharexylon teres Jacq. as a synonym of Citharexylon cinereum L. (as do also Steudel and Schauer in the references cited above), but Jacquin's binomial belongs in the synonymy of C. spinosum instead. There is a "Jacq., Ic. Pl. Rar., ed. 1, 4, pl. 82. 1781" sometimes cited to C. fruticosum (for instance, by O. E. Schulz in Urb., Symb. Ant. 6: 63. 1909), but I am unable to trace this edition. Plate 82 in the 1781—1796 work, the only edition known in the library of the New York Botanical Garden, is a Dianthus species (Caryophyllaceae).

In the Linnean Herbarium in London, sheet 2 under genus 777 is labeled "Citharexylon cinereum", but is actually Schlegelia violacea (Aubl.) Griseb. (Bignoniaceae). I examined this specimen in London in 1935 and photographs of it are in my own and in the Britton Herbarium at the New York Botanical Garden. The "Citharexylum cinereum L." illustrated by H. Apolinar Maria in his Vocab. Term. Vulg. Hist. Nat. Colomb. in Revista Acad. Colomb. 1: 358 (1937) is actually C. karsteni var. lanceolatum Moldenke, and the vernacular names "agracejo" and "palo blanco" which he records for it therefore apply to that variety and not to this species. The wood of C. fruticosum is said to be used commercially in Cuba.

The Cornell sheet of Pollard, Palmer, & Palmer 28 has a few hairs in the vein axils on the lower leaf-surface, but not enough to place it definitely in var. subvillosum.

C. fruticosum is reported to be the host for numerous insects by Wolcott & Otero in the reference cited above: Pyrausta cerata Felt, Calpoptera maculata Doxier, Ormenis quadripunctata Felt, Flatoides punctata Walker, Pulvinaria psidii Marshall, Ischnaspis longirostris Signoret, Agathodes designalis Guenee, and Acrocercops inconspicua Forbes. It is also attacked by the fungus Irene longipoda (Gaill.) Toro.

O'Neill reports on the label of his no. 7122 that he found an average of 392 trees of this species per acre where counts were made. Sudworth states that the species grows in Florida from Cape Canaveral to the southernmost Florida keys and is everywhere known as "fiddlewood". The Broadway 4064 and 6658, widely distributed as this species, appear to represent a natural hybrid with C. spinosum and are herein cited under xC. hybridum Moldenke.

In all, 701 herbarium specimens, including the types of most of the names involved, and 7 mounted photographs have been examined.

Don in Edinb. New Philos. Journ. 11 (Jan.--Mar.): 238 (1831) places C. cinereum Sessé & Moc. in the synonymy of his C. lucidum [=C. ellipticum Sessé & Moc.]. However, the type of this binomial is from Puerto Rico, and so cannot belong to this Mexican species. It is obviously C. fruticosum.

Citations: FLORIDA: Brevard Co.: Burgess 765 (F--157225, N); Curtiss 1969 (A, B, B, Bm, C, Cm, E--119118, E--874252, F--148303, G, Gg--163164, K, L, Mi, Mu--1607, Pa, T, Up, Vt, Vu, W--41194, X), 5722 (Al, Ca--104987, Cb, Cb, E--119115, E--887470, Ed, Ed, Fl--20949, G, Io--38744, It, K, Ka, L, N, P, Po--64357, Ur, Vt, Vu, W--280800, X); Degener s.n. [Tropic, Aug. 15, 1933] (Ba, Ur, Ur); O'Neill 7120 (I); Rhoads s.n. [Orchid, Feb. 23, 1937] (Fl--25822). Dade Co.: Bailey & Bailey 6429 (Ba); Bessey 26 (A); N. L. Britton s.n. [Jan. 21, 1905] (N); Buswell s.n. [May 16, 1934] (Bu); Chapman 89 (D, E--119114), s.n. (W--968542); Cowles S.20-20, in part (Bt--31744, Cb, W--1584824), s.n. [Miami, '06] (Ur); Curtiss s.n. [Miami, July 17] (W--1583190); A. A. Eaton 304 (F--166678, F--230876), 757 (F--231002, Oa); A. P. Garber s.n. [Miami, Feb.--July 1877] (Vt), s.n. [Miami, July 1877] (Pa), s.n. [Miami] (D, G, W--57462); J. A. Harris C.17377 (A), C.191051, in part (W--1435851); Harshberger s.n. [August 15, 1911] (Up--63206), s.n. [Dec. 1911] (Up); Howell 886 (W--893575); C. D. Mell s.n. [Miami, Jan. 1907] (W--1584899); H. N. Moldenke 3583 (N, Z), 5627 (Z), 5637 (N, Z); Mulvania 26 (Hp); O'Neill 7121 (I), 7122 (I), 7123 (I, I, I), 7124 (I, I), s.n. [Brickell Hammock, July 22, 1929] (W--1488531), s.n. [Miami, July 22, 1929] (Fl--20948), s.n. [Sykes Hammock, Sept. 6, 1929] (Fl--20947, W--1488515); Ostenfeld 175 (Cp); Rehder 763 (A), 817 (A, B, K), 860 (A), 894

(A, A, B, K); Safford 293 (W—1036129, W—1036130, W—1036131); Safford & Mosier 73 (W—1035908); Sargent s.n. [Hunting ground] (A); C. Skottsberg s.n. [Miami, 18/5/1935] (Go); J. K. Small 3861 (N); Small & Nash 30 (Ar—7505, N, N); Small & Small 4719 (Fl—27762); Tidestrom 6956 (Ar—7504, Ar—10131, S, W—693910). Indian River Co.: Rhoads s.n. [Roseland, 12 Jan. 1937] (Fl—25543). Martin Co.: J. A. Harris C.191051, in part [Hobe Sound] (H—10279). Monroe Co.: Killip 31698 (N); E. Scull s.n. [Long Pine Key, 8/25/37] (Bt—45940), s.n. [Long Pine Key, 6/15/38] (H—50708). Palm Beach Co.: A. S. Hitchcock 1487 (F—233564), s.n. [Palm Beach] (F—233563); O'Neill 824. BAHAMAS: Brace 4351 (F—199489, N, N, W—655349); Nash & Taylor 935 (F—185303, F—185960, N); P. Wilson 7517 (F—221633, K, N), 7730 (F—221849, K, N). CUBA: Camagüey: León 16463 (Ha); Shafer 955 (B, F—285980, G, N, W—697230, W—659422), 2471 (Bm, D—537579, F—251005, G, N, P, W—848711), 2693 (Bm, F—251182, N, W—848866). Havana: Britton, Earle & Gager 6301 (N, W—697004); Ekman 13473 (S); Fortún 549 (Es), s.n. [Herb. Roig 549] (Rg); León 4226 (N), 7156 (N); Moldenke & Moldenke 19864 (N), 19865 (Es, Lg, Mg, Mr, N, No, Ot, Sm); Sagra 306 (Dc); P. Wilson 1682 (B, Es, N, Po—63520). Las Villas: Jack 4538 (A, W—1430913), 4646 (A, K, K, Po—174968), 5079 (B, K, P), 5091 (A, B, K, P), 5514 (A, P, S, Us), 7359 (A, B, Cp, P, S), 8141 (A, N); Luna 643 (Ha, N); Salvoza 535 (A). Matanzas: Britton & Wilson 99 (N), 197 (N); Rugel 334 (M). Oriente: G. C. Bucher 1a (F—598809), 11473 (Es); Clement 3124 (Ha, N); Ekman 6268 (N, S), 8638 (B, N—photo, S, Z—photo), 14722 (S), 14727 (B, Ha, N); Pollard, Palmer, & Palmer 28, in part (A, D—507923, F—125561, G, It, N, W—403119); Roig 6595 (Es); Shafer 1824 (N), 3934 (F—286310, N, W—697590), 7767 (B, N, W—696384); C. Wright 438 [1865; Herb. Sauvalle 1766, in part] (B, B, Hv). Pinar del Río: Britton & Earle 7568 (N); Britton, Earle, & Gager 6864 (N, W—697070); Britton & Gager 7637 (N, W—658726); O'Donovan 5204, in part (Es); Roig 1045 (Es), 6280 (Es), 6336 (Es); Shafer 11139 (E—119080, F—325381, G, N, Ut, W—699295), 13449 (B, N, W—757328); P. Wilson 11402 (N, W—698760). Province undetermined: Bonpland s.n. (P); Poeppig s.n. (E—216458). JAMAICA: R. C. Alexander s.n. [24 Ap. '50] (K); N. L. Britton 1070 (N), 3257 (N), 3774 (N); Britton & Hollick 1885 (N), 2363 (N); Dancer s.n. (Cb); Distin s.n. (K); Fredholm 3169 (N, W—316015); W. Harris 8608 (B, D—571260, N), 8840 (B, Bm, F—174411, F—185313, F—242739, N, W—656447), 10169 (B, Bm, Cp, F—243175, K, N, P, W—656947); A. S. Hitchcock s.n. [Lucea] (E—119095, F—228165); Marble 848 (N); March 954 (B, K); McCatty s.n. (K); Swartz s.n. (Dc, S); N. Wilson 176 (Le), 381 (B), s.n. (K);

Wolle s.n. (G). HISPANIOLA: Dominican Republic: Abbott 301 (W--1078682), 304 (B, N, W--1078681), 453 (B, W--1078680), 2559 (B, W--1145722), 2893 (E--920667, G, W--1147335); H. A. Allard 13896 (S); Chardon 744 [host] (It), 877 [host] (It); Desfontaines 1019 (Bm); Faris 348 (W--1145908), 451 (W--1145980); Fuertes 88, in part (B, Bm, Cb, Cb, Cb, E--706524, Ed, G, K, L, Le, Lu, N, P, Ut, V--6289, W--658180, W--658181); Herb. Persoon s.n. (Le); Howard & Howard 8730 (N), 9469 (N), 9757 (N); Mertens s.n. (B); Prenleloup 431a (B), 431b (B); L. C. Richard s.n. [S. Dom.] (Cb, P, P); Scarff 24a (F--924740, Y--35325); N. Taylor 261 (B, F--250846, N), 334 (B, F--250888, N); Türckheim 2513 (B, B, Bm, Br, Cb, Cb, Cb, E--119081, Ed, F--298533, G, Io--70576, K, Le, Le, Mu--4112, N, P, S, Ut, V--1349, W--656061); Wright, Parry, & Brummel 307 (F--575083, W--57321), 308 (It, W--57322, W--209865). Haiti: W. Buch 479 (B), 591 (B); Ekman H.8340 (B, N, S, W--1413025); Herb. Harvey s.n. [Haiti, 1842] (Du--166404, in part); Leonard & Leonard 7047 (N, W--1149030), 7705 (G, W--1149518), 11081 (Ba, Mi, W--1450078), 11218 (A, N, W--1450207), 11308 (Ca--439942, E--993073, J, K, W--1450285), 13549 (W--1452191), 14125 (W--1452688); Nash 30 (Es, F--158646, G, K, N), 290 (F--158751, N), 430 (F--158796, N), 914 (N), 959 (F--185301, N); Poiteau s.n. [Saint-Dominigue, 1802] (Cb, Cb, Cb, Cb), s.n. [Sto. Dom.] (B, B), s.n. [1 Nov. 1816] (L); Ritter s.n. (V, V, V). BEATA: R. A. Howard 12377 (N). PUERTO RICO: Britton, Britton, & Brown 6937 (N); Britton, Britton, & Hess 2749 (N, W--758949); Britton & Cowell 1968 (N); Britton & Shafer 1587 (N, W--758338); Cowles 186 (W--697740); Finch 70 (N, W--1556725); Gerhart & Holdridge 538 (N); Goll 827 (W--409370); Gregory 196 (N); Gundlach 1435 (B), 1471 (B); A. A. Heller 4421 (A, B, Cb, D, E--119085, Es, F--80566, G, It, Le, Mi, N, Po--64358, W--362647); Heller & Heller 213 (B, Bz--18719, F--119565, It, K, N, W--425743), 1166 (N), s.n. [east of Ponce, Dec. 3, 1902] (N, W--426623); Herb. Ventenat s.n. (Cb, Cb); Hess 1690 (N), 4737 (J); Hioram s.n. [Sept. 28, 1912] (N); Johnston & Stevenson s.n. [Herb. Exp. Sta. Río Piedras 1858] (N); Plée 587 (P, P), s.n. (P, P); Schwanecke s.n. (B); Sessé, Mociño, Castillo, & Maldonado 2370 (F--849482, It--photo, N--photo, Q, Z--photo); Sintenis 720 (B, F--79405, G, Io--75747, K, L, Lu, Mu--1179, S, W--1323191, X, X), 720b [Hort. Thenensis I.2920] (B, Bm, Br, C, Cb, Cb, Cm, Cp, E--119087, Ed, Es, Lu, Mu--3762, N, Ol, Ol, P, Po--63506, R, S, Us, Vu, Vu, X), 1386a (L), 1915 (B, S, Vu), 2085 (Ed), 2321 (B, E--119086, G, G, K, K, L, Le, Lu, N, V--146, W--403459), 3418 (Lu), 3723 (B, Bm, G, K, V--145, W--403460), 4969 (B, B, Cb, F--80003, Mu--3761, Mu--3763, P, X), 5088 (B, Es, S), 6787 (B, N), 7206 (Lu), s.n. [X.86] (G), s.n. [12.4.85] (G); Stahl 802 (B, S), s.n. [XI. 1887] (Le); F. L. Stevens 7722 [535] (Ur); J. A. Stevenson 2185 (W—1475281); Underwood & Griggs 470 (N, W—405414), 770 (N, W—405707). CRAB ISLAND: Eggers s.n. [Oct. 1876] (G); Shafer 2370 (Gg—31073, N, W—759951). VIRGIN ISLANDS: Anegada: Britton & Fishlock 1043 (N, W—756783). Jost Van Dyke: J. S. Beard 315 (N). St. Croix: Benzon 5 (S), s.n. (Cp); A. E. Ricksecker 182 (B, Ca—473015, E—119075, F—70513, G, N, Ob—14854, Ob—14855, W—278073); L. A. Ricksecker 168 (B, E—119076, Ed, F—87813, P, W—425310); Rose, Fitch, & Russell 3622 (B, F—599447, F—689832, G, W—639759); West s.n. (S). St. Thomas: Eggers s.n. [Canaan, Sept. 1880] (B, Cb, F—241761, F—241762); Krebs s.n. (S); Kuntze 85 (N); Paulsen 124b (N); Read s.n. (D); L. C. Richard ? s.n. (P); Riédlé 80 (P), s.n. (P, P). LEEWARD ISLANDS: Barbuda: Fairchild 3849 (W—1556621). Dominica: West s.n. (Cp). Guadeloupe: Parker s.n. [1824] (K); Read 14 (D), s.n. [Herb. Philad. 479] (B). Montserrat: Ryan s.n. (Cp, Cp). St. Bartholomew: Forsström s.n. (S, S, S, S); Herb. Mus. Bot. Lund s.n. [Bartelemi] (Lu). WINDWARD ISLANDS: Grenada: W. E. Broadway s.n. [Nov. 11, 1904] (E—119090, G, N, W—429561); Masson s.n. (Bm). Martinique: Denisse s.n. [1844] (Du—166404, in part). St. Lucia: R. A. Howard 11389 (N), 11433 (N). St. Vincent: Collector undesignated s.n. [1824] (G); Guilding s.n. (K); Smith & Smith 664 (K). TRINIDAD: Bailey & Bailey s.n. [Feb. 5, 1921] (Ba); W. E. Broadway 6374 (A, Bm, Bm, E—932250, F—689809, K, K, S, W—1284694), s.n. [Nov. 1904] (F—175777), s.n. [Aug. 29, 1932] (A, Bm, I, K), s.n. [Sept. 16, 1932] (A, Bm, E—1031050, I, K); Dannouse s.n. [Maracas Bay] (N, R). WEST INDIES: Island undesignated: Forster s.n. (K); Herb. Le Monnier s.n. (Cb, Cb, Cb); Herb. Liebmann s.n. (Cp); Herb. Mohr s.n. (W—771907); Herb. Rottböll. s.n. (Cp, Cp, Cp); Herb. Schumacher s.n. (Cp); Herb. Torrey s.n. (T); Herb. Vahl s.n. (Cp, Cp); Mus. Bot. Berol. s.n. (B); Nuttall s.n. (D); L. C. Richard s.n. [ex India occidentali] (Cb); Ryan s.n. (Bm). VENEZUELA: Sucre: W. E. Broadway 118 (G, N, W—1187841). SURINAM: Poiteau s.n. (F—686693, F—686696); Samuels 280, in part (N, P), 308 (G, K, N). "GUIANA", exact locality undesignated: Herb. Ledebour s.n. (L). CULTIVATED: Austria: Herb. Portenschlag s.n. (V). Belgium: Nyst s.n. (Br, Br). Cuba: Jack 7359 (F—719529); Singleton 877 (Oa). Florida: Chapman s.n. (E—119116, E—119117, W—1323192); Walsingham s.n. [Chapman Field, Nov. 17, 1930] (Ar—19771, Ba). France: Herb. Le Monnier s.n. (Cb); Hort. Paris s.n. [1821] (Cb). New York: H. N. Moldenke 8383 (N); N. Taylor s.n. [N. Y. Bot. Gard. Cult. Plants 13449] (N). Pennsylvania: Herb. Bartram's Garden, Philadelphia, s.n. (D). Switzerland: Hort. Genev.

s.n. [Sept. 1857] (Cb). LOCALITY OF COLLECTION UNDESIGNATED: Collector undesignated 48 (Dc), 58 (Q); Herb. A. L. Jussieu 5088 (P, P). MOUNTED ILLUSTRATIONS: Addisonia 15: pl. 496 (S); Krug, Icon. Pl. Portoric. pl. 91 (B).

CITHAREXYLUM FRUTICOSUM var. BRITTONII Moldenke, Alph. List Common Names 5, 9, 10, 12, 14, & 33, hyponym (Aug. 31, 1939), Lilloa 4: 311. Oct. 11, 1939.

Synonymy: Citharexylum broadwayi O. E. Schulz in Urb., Symb. Ant. 7: 354--355. 1912. Citharexylum brittonii Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. Citharexylum fruticosum var. brittonnii Moldenke ex H. N. & A. L. Moldenke, Pl. Life 2: 51, sphalm. 1948.

Literature: O. E. Schulz in Urb., Symb. Ant. 7: 354--355. 1912; Freeman & Williams, Useful Pl. Trin. 39. 1928; Marshall, Trees Trin. & Tob. 76. 1934; Moldenke, Alph. List Common Names 5, 9, 10, 12, 14, & 33. 1939; Moldenke, Geogr. Distrib. Avicenn. 12 & 36. 1939; Moldenke, Lilloa 4: 311. 1939; Moldenke, Prelim. Alph. List Invalid Names 16. 1940; Moldenke, Alph. List Invalid Names 14. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 30, 71, & 88. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 61, 67, 68, 98, & 131 (1946) and 2: 612. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 51. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 57, 157, & 179. 1949; Moldenke, Alph. List Cit. 3: 870 & 885 (1949) and 4: 1007-1009, 1050, 1057, & 1133. 1949; Moldenke in Cheesman, Fl. Trin. & Tob. 2 (6): 21. 1955.

This variety differs from the typical form of the species in having its leaf-blades densely velutinous villous-pubescent beneath. It differs from var. villosum (Jacq.) O. E. Schulz in having the leaf-blades at time of anthesis very thin-membranous and the young leaves even at other times being also very thin. Even the fully matured leaf-blades are much thinner in texture and with less prominent venation than in the typical form of the species or in var. villosum.

It is a small tree, to 6 m. tall; branches medium, white or very light-gray, obtusely tetragonal, glabrous; branchlets slender, brown, acutely tetragonal, minutely puberulent or strigillose, becoming glabrate in age; nodes inconspicuously annulate; principal internodes 2--4.6 cm. long; leaf-scars large, with prominent margins, on older branches borne on large corky sterigmata 4--5 mm. long and about 4 mm. wide; leaves decussate-opposite (or approximate on young shoots); petioles slender, 5--9 mm. long, sparsely strigillose or subglabrate; leaf-blades membranous when young, thin-chartaceous when mature, darker above and nigrescent in drying when immature, lighter beneath, dull or subnitid in age, lanceolate or elliptic, 8.5--9 cm. long, 2.2--3.2 cm. wide, acute or acuminate at the apex, entire, short-cuneate at the base, bearing a pair of medium-sized black glands at the very base, very sparsely and minutely strigillose or puberulent on both surfaces, especially along the midrib and larger veins, becoming subglabrate, punctate beneath; midrib slender, plane above, prominulous only at the base beneath; secondaries very slender, 5—7 pairs, ascending, often hardly arcuate, rather obscurely anastomosing; veinlet reticulation conspicuous beneath, but not at all prominulous; racemes terminal and terminating axillary branchlets, 7—8.7 cm. long, about 1 cm. wide, many-flowered, erect; peduncles slender, 1—1.5 cm. long or less, puberulent; rachis slender, densely puberulent or shortly canescent-pubescent; pedicels very slender, to 1 mm. long or obsolete; prophylla setaceous, 0.5—1 mm. long, pubescent; flowers erect-patent; calyx oblong-cyathiform, about 4 mm. long, short-pilose, the rim truncate, lightly 5-repand-dentate and ciliate; fruit reddish-brown.

The type of this variety was collected by Walter Elias Broadway (no. 3198) on the seashore, Cedros island, on January 15, 1908, and is deposited in the herbarium of the Botanisches Museum at Berlin. The type of C. brittonii was collected by Nathaniel Lord Britton (no. 2921) — in whose honor it and the variety are named — on a wooded hillside near the mouth of the Godineau River, Trinidad, on April 12, 1921, and is deposited in the Britton Herbarium at the New York Botanical Garden. It was at first assumed by me that Schulz's C. broadwayi and my C. brittonii were separate taxa, but their conspecificity was determined before the taxon was given varietal status by me. The variety was based on Schulz's type, but the epithet used for my proposed species was adopted as the varietal epithet.

The variety is remarkable because of its white branches, brown twigs, and membranous immature leaf-blades. Immature leaf-blades of C. caudatum L. and of the other varieties of C. fruticosum L., as well as of the typical form, are not so plainly thinner than the mature ones. Schulz says "Citharexylo fruticoso var. villoso certe affine, sed nervis lateralibus foliorum supra non prominentibus et pedunculo brevissimo differt." It has been collected in anthesis from April to June and in August and November, and in fruit from August to October and in June. It is said to inhabit seashores and the banks of streams, and has been confused with C. quadrangulare Jacq. [=C. spinosum L.]. The following vernacular names have been recorded: "bois coteletto", "bois cutlet", "coteletto", "cutlet", "fiddlewood", "hairy cutlet", and "white fiddlewood". Of these, however, "bois coteletto" is also applied to var. villosum, "cutlet" to C. fruticosum, C. fruticosum var. villosum, and C. spinosum, "fiddlewood" to var. villosum, C. spinosum, Cornutia pyramidata L., Petitia domingensis Jacq., Vitex gaumeri Greenm., and V. umbrosa Sw., and "white fiddlewood" to C. caudatum, C. fruticosum, C. fruticosum var. villosum, Vitex capitata Vahl, and V. compressa Turcz.

Trin. Bot. Gard. Herb. 7203 shows a binary leaf! In all, 37 herbarium specimens, including the types of all the names involved, and 12 mounted photographs have been examined.

Citations: TRINIDAD: N. L. Britton 2921 [Trin. Bot. Gard.

Herb. 10031] (E—photo, G. N. N—photo, N—photo, R, S—photo, W—1194559, W—photo, Z—photo, Z—photo); *W. E. Broadway 3861* (B, Bm, F—388029, Le, Mu—4307, N, R, R), *6371* (A, Bm, E—932290, F—689806, K, S, W—1284693), *s.n.* [Trin. Bot. Gard. Herb. 7344] (R), *s.n.* [Trin. Bot. Gard. Herb. 12238] (K); *Chancellor s.n.* [Trin. Bot. Gard. Herb. 8363] (R); *Crüger s.n.* [Trin. Bot. Gard. Herb. 2397] (B, N, R, W—1323221); *C. King s. n.* [Trin. Bot. Gard. Herb. 7203] (R); *F. R. Russell s.n.* [Trin. Bot. Gard. Herb. 12238] (R), *s.n.* [Trin. Bot. Gard. Herb. 12239] (R); *R. O. Williams s.n.* [Trin. Bot. Gard. Herb. 12035] (K, N, R), *s.n.* [Trin. Bot. Gard. Herb. 12192] (R). CEDROS: *W. E. Broadway 3198* (B—type, E—photo of type, N—photo of type, S—photo of type, W—photo of type, Z—photo of type); *Rorer s. n.* [Cedros, June 6, 1911] (R, R). CULTIVATED: Trinidad: *Trin. Bot. Gard. Herb. 2398* (R).

CITHAREXYLUM FRUTICOSUM var. SMALLII Moldenke in Fedde, Repert. 37: 223. 1934.

Synonymy: *Citarexylum fruticosum* var. *smallii* Moldenke apud Alain in León & Alain, Fl. Cuba 4: 300, sphalm. 1957.

Literature: Greenm. in Millsp., Field Columb. Mus. Publ. Bot. 2: 179. 1907; Moldenke in Fedde, Repert. 37: 223. 1934; Moldenke, Geogr. Distrib. Avicenn. 4. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 24 & 88. 1942; Moldenke, Alph. List Cit. 1: 55, 56, 60, 65, 112, 272, 302, 307, 308, & 312 (1946) and 2: 543. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 84. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 42, 43, & 179. 1949; Moldenke, Alph. List Cit. 3: 739, 765, 773, & 943 (1949) and 4: 1037. 1949; Alain in León & Alain, Fl. Cuba 4: 300. 1957.

This variety differs from the typical form of the species in its very narrow and linear, lanceolate, linear-lanceolate, or oblanceolate leaf-blades, which are 1.5—12 cm. long and 6—24 mm. wide and are often more or less falcate. The petioles are 5—15 mm. long. The leaf-blades occasionally bear 1 or 2 pairs of small teeth near the apex, or very rarely on the most oblanceolate type of blades these teeth are large and lobe-like. The plant is a shrub with spreading branches, very glabrous and shiny throughout, or occasionally the lower leaf-surfaces are only subglabrate and punctate.

The type of the variety was collected by John Kunkel Small and Joel Jackson Carter (*no. 8583*) in a coppice near Deep Creek, Long Bay Cays section, *Andros island*, Bahamas, between January 20 and 22, 1910, and is deposited in the Britton Herbarium at the New York Botanical Garden.

This is the form reported in Field Columb. Mus. Publ. Bot. 2: 179 (1907) as *C. berterii* Spreng. and identified by B. L. Robinson as *C. bahamense* Millsp. The *Northrop & Northrop 608* collection bears more or less abnormal *flowers*, perhaps due to gall insect infestation.

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CRATAEGUS HILLII SARGENT

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This species was originally described by C. S. Sargent in "The Botanical Gazette" (35:384; 1903) from Thatcher's Park, Ill.[1] Thatcher's Park was a station on the M.St.P.& S.S.M. Ry., or Wisconsin Central R.R., located at the point where it turns from the southeast to the south in what is now the village of River Forest at Iowa Street. There is now no station or sidetrack at that location.

River Forest is a residential village of large homes and is bordered on the east by the village of Oak Park and on the west by the Des Plaines River. Thatcher Avenue runs north and south a quarter of a mile west of the old station of Thatcher's Park and marks the western border of the settled area. The area between Thatcher Avenue and the Des Plaines River is owned by the Forest Preserve District of Cook County and is known as Thatcher Woods.

There is a colony of trees in the northern part of Thatcher Woods that fits Sargent's description of hillii fairly well. The colony extends eastward to Thatcher Avenue and undoubtedly extended farther east before the neighborhood was built up. In 1957 I explored the area north of North Avenue and found several trees west of Thatcher Avenue and along Thatcher Avenue. There is a large tree at the east edge of the east sidewalk of Thatcher Avenue north of Bloomingdale Avenue in the village of Elmwood Park. It is very doubtful that any specimens can be found north of Fullerton Avenue, and I have found none south of Augusta Street.

Hillii is a unique species, originating as a hybrid and developing distinctive characters in orthogenetic evolution within a very limited area. The haws are large, 13-21 mm. long and 14-21 mm. wide, and typically slightly obovoid. The haws of some trees are orange-pink when ripe and never darker. The flesh is thick and delicious. Sargent's original description of the nutlets read: "Nutlets 4 or 5, thin, acute at the ends, irregularly ridged and sometimes grooved on the back, about 9 mm. in length." The description in his "Manual of the Trees of North America" reads: "Nutlets 4 or 5, thin, gradually narrowed and acute at the ends, irregularly ridged and sometimes grooved on the back, about 3/8" long." These descriptions fit exactly the nutlets from the trees in Thatcher Woods. Such long nutlets, averaging 9 mm. in length and acute at the ends, are exceptional for any species of the Coccineae or nearby series and distinguish this species from other plants that may have similar leaves and flowers but different nutlets.

On P. 47 of my "Manual of the Hawthorns of Cook and Du Page Counties of Illinois" I mentioned a tree in the Glenview Woods with leaves and flowers like hillii but different haws. I am now convinced that this tree is not hillii but an undescribed local hybrid of mollis and tortilis and that it was a mistake for me to broaden the description of hillii to include the characters of this tree. I am therefore correcting the description of hillii as shown in the following two pages by restricting it to reflect the characters displayed by the plants in Thatcher Woods and environs.

[1] Shown on a map in H. C. Cowles's "The Plant Societies of Chicago and Vicinity (Geog.Soc. Chgo.; 1901).

CORRECTED DESCRIPTION OF CRATAEGUS HILLII SARGENT AMENDING P. 46 OF KENDALL LAUGHLIN'S "MANUAL OF THE HAWTHORNS OF COOK AND DU PAGE COUNTIES"

Bark on young trees slate-gray, smooth; bark on old trees dull dark gray, thick, somewhat scaly and fissured into short irregular vertical plates. Branchlets 1.7-2.9 mm. thick; young branchlets villous, becoming glabrous late in the season; light red-green, brown or reddish brown, often studded with numerous gray lenticels, in their first year, and rather lustrous brown, reddish brown, dull gray-brown or cinereous in the following year. Winter buds 3-6 mm. long. Spines on branches sparse, 3.5-5.6 cm. long, slender, straight, castaneous, slate-colored or dark reddish brown.

Leaves suborbicular or sometimes ovate, obtuse to truncate at the base, with a short acute apex and 4 or 5 pairs of dentate or acute lobes, sharply serrate, 5.2-9.1 cm. long, 4.3-8.2 cm. wide, falling in September, thin when young, firm at maturity, dull moderate yellow green above and pale beneath when young, darker at maturity on some trees; upper surface of young leaves covered with very short white hairs, scabrous or glabrous at maturity; undersurface of young leaves villous on the stout orange midrib and 5-7 pairs of straight or arcuate primary veins, slightly impressed above.

Petioles 1.7-5 cm. long, subterete, with a nearly closed groove, densely villous, red on the upper side.

Flowers blooming May 4-22 on densely villous pedicels in 6-12-flowered lax compound corymbs, 20-26 mm. wide, saucer-shaped.

10-20 stamens in two rows with filaments 4-6 mm. long and purplish pink anthers.

(3-)4-5 pistils.

Calyx-lobes lanceolate, coarsely glandular-serrate.

Haws ripening in the first half of September, soon falling, on short drooping villous pedicels, typically slightly obovoid, sometimes subglobose and flattened at the ends, slightly depressed at the base, 5-angled, glabrous, lustrous orange-pink to scarlet with green dots, 13-21 mm. long, 14-21 mm. wide, with thick firm juicy acidulous yellow flesh. Calyx sessile, usually with erect lobes.

Nutlets usually 5, sometimes 4, light reddish brown, 8-10 mm. long, 4-5 mm. wide, thin, acute at the ends, with a high ungrooved or rarely grooved ridge and plane ventral faces.

CORRECTED DESCRIPTIVE TEXT OF CRATAEGUS HILLII SARGENT AMENDING P. 47 OF KENDALL LAUGHLIN'S "MANUAL OF THE HAWTHORNS OF COOK AND DU PAGE COUNTIES"

This species is confined mostly to an area of about 25 acres in the northern part of Thatcher Woods. There are a few trees in Evans Woods and along Thatcher Road north of North Avenue, but no trees have been found in the Des Plaines River woods north of Fullerton Avenue.

Previously published descriptions of this species state that the stamens are 20. The flowers that I have examined in Thatcher Woods have 10 to 20 stamens. The A.F.A. champion there is a magnificent, densely branched trees with long, drooping lower branches, a circumference of 4', a height of 36' and a spread of 40'. This tree has 10-20 stamens and orange-pink mostly obovoid haws. The odd number of stamens and cytological studies of its polyspory (the mother cells of its anther sacs have six pollen grains) indicate that hillii is of hybrid origin. The most likely parents are mollis and pedicellata var. robesoniana. The colony in Thatcher Woods, encompassed on the northwest by the Des Plaines River and on the east by prairie, is probably a very old ingrown colony and has probably undergone a long process of evolution.

The distinctive and exceptionally long nutlets of hillii, 8 to 10 mm. long and narrow at the ends, distinguish it from other related species.

Hillii, however, hybridizes with mollis, and plants of mixed origin may show mixed characters.

CRATAEGUS MAGNIFLORA SARGENT

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This species was originally described by C. S. Sargent in "The Botanical Gazette" (35:383; 1903) with the notation "Borders of woods in gravelly soil; Glendon Park; collected by E. J. Hill in * * * 1901." Glendon Park was the old name for River Grove, Ill., a village with a population of 4,839 on the C.M.St.P.& P. R.R. on the Des Plaines River.

Glendon Park must have been rich in Hawthorns in those early days. Sargent mentioned it as the type locality of *cyanophylla* and *depilis* and a habitat of *apiomorpha*, *hillii* and *sertata*. Probably a large proportion of these Hawthorns were on the plain east of the river bottom and were destroyed in the building up of River Grove.

I do not know how far those early botanists regarded Glendon Park as extending from the railroad station. River Grove station is only half a mile south of the southeast corner of the Chechupinqua Woods, one of the two known habitats of *magniflora*. The Chechupinqua Woods extend north from Belmont Avenue about a mile to Ill.Hiway 19 (Irving Park Rd.). Owned by the Forest Preserve District of Cook County, the area was annexed to the City of Chicago in 1958. These woods contain sixty-five species of trees, including eleven Hawthorns, and four A.F.A. champions.

I have studied these woods critically since 1936, but it was not until 1953 that I found a single specimen of *magniflora*. In 1957 I found six more trees in bloom, mostly in the southeast sector.

In 1958 I discovered a small colony of *magniflora* with tall straight trunks in Thatcher Woods. The largest tree has a circumference of 1'3", a height of 26' and a spread of 23'.

The following page shows a revised description based on the characters displayed by these additional trees.

Magniflora resembles *tortilis* in the number of its stamens and pistils, the color of its anthers, its calyx-lobes and its glabrate pedicels, petioles and undersurface of leaves, but its leaves are different, its flowers are larger and sparser and its filaments are longer. The large, obscurely lobed, coarsely serrate leaves are almost enough to identify it in the field.

The ranges of *magniflora* and *tortilis* are complementary; *magniflora* is found south of Ill.Highway 19 and *tortilis* ranges north of Ill.Hiway 19 into Wisconsin. *Magniflora* may be regarded as being vicarious in relation to *tortilis*; but there is no difference in the environment or barrier to warrant a phylogenic segregation of species on the theory of a common origin. Nor are the characters of *magniflora* intermediate between species of the same region, so that there is no good evidence of hybrid origin.

Magniflora blooms sparingly and in most years in the individual trees the flowers are confined to upper branches. The flowers are usually 22-28 mm. wide, whereas the width in Sargent's description was given as 25-30 mm., but they are still among the largest of the Hawthorn flowers. Its nutlets are usually 4 or 5, sometimes 3. Where the number is

3, the backs are marked with abrupt high irregular ridges separated by deep grooves.

Magniflora is one of the best of the Hawthorns because of its tall straight trunk, well balanced crown, large flowers and delectable haws.

G. N. Jones in his tragically slipshod treatment of Crataegus in his "Vascular Plants of Illinois" credits Palmer with sending him his specimens of magniflora, whereas the species is native only in Illinois and he could have gotten native material by diligent exploration or contact with informed persons.

CORRECTED DESCRIPTION OF CRATAEGUS MAGNIFLORA SARGENT AMENDING P. 44 OF KENDALL LAUGHLIN'S "MANUAL OF THE HAWTHORNS OF COOK AND DU PAGE COUNTIES"

Bark dull grayish-brown, thin, separating into narrow vertical plates. Branchlets glabrous, flexuous, rather crowded, red, red-green or reddish brown with scattered gray lenticels, becoming brown, reddish brown or gray-brown the following year. Winter buds 2-2.5 mm. long, dark red. Spines on branches 2-5.2 cm. long, stout, curved, dark chestnut-brown, brown, red-brown, bright red, or dull slate-colored or cinereous.

Leaves ovate-orbicular, oblong-ovate or oval, rounded or slightly subcordate at the base, acute at the apex, with 5-7 pairs of obscure lobes, coarsely and irregularly serrate, 6-9.8 cm. long, 4.7-7.6 cm. wide, thin, dull dark yellowish green and scabridulous above, slightly paler and glabrate beneath, with a slender midrib and 5-7 pairs of nearly straight primary veins.

Petioles 2-5.2 cm. long, slender, subterete, shallowly grooved, rarely slightly glandular, glabrate, red on the upper side when young.

Flowers blooming from April 28 to May 19 on long glabrous or glabrate pedicels in 5-9-flowered lax simple or compound corymbs, (19-)22-28 mm. wide, flattish or saucer-shaped.

(17-)20 stamens with filaments 4-8.5 mm. long and dark reddish purple anthers.

3-5 pistils.

Calyx-lobes lanceolate, glandular-serrulate, appressed in anthesis.

Haws ripening September 10-20, in few-fruited drooping corymbs, slightly obovoid, subglobose or short-oblong, flattened at the ends and slightly depressed at the base, glabrous, lustrous scarlet with very small scattered green dots, often blotched with green at the apex, 14-20 mm. long, 14-18.5 mm. wide, with thick juicy acid yellow flesh. Calyx sessile with a broad obconic tube, bordered by the persistent bases of the filaments and spreading lobes.

Nutlets usually 4 or 5, sometimes 3, (6.5-)8-9.5 mm. long, 4-6 mm. wide, subpyriform with an abrupt hump beyond the middle on the back, acute at the other end, grooved in the case of haws with 3 or 4 nutlets, with plane or more often convex ventral faces.

QUERCUS MUTABILIS IN THE [1]BIG OAK TREE STATE PARK OF MISSOURI

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MORPHOLOGY OF [2]MIQUORIA [6]ECOTYPES

CHARACTER	QUERCUS PALUSTRIS	QUERCUS MUTABILIS	QUERCUS SHUMARDII
Leaves (glabrous above; axillary tufts of rusty hairs beneath):			
Length	7.5-11 cm.	4.2-14 cm.	9-17 cm.
Width	4.5-8.5 cm.	2.5-11 cm.	5.5-12 cm.
No. of pairs of lateral lobes	2-3	2-3	Usually 3
Change in width of the second (and largest) lobe from the sinuses toward the apex or lobules	Constant; lobed and toothed	Narrower; entire or toothed with very small lobules	Broader; lobed and toothed
Shape of base	Acute or obtuse	Truncate, broadly rounded or obtuse	Truncate or obtuse
Average length of longest bristle	5 mm.	6 mm.	4 mm.
Color of midrib	Tawny or pale	Yellow	Pale yellow
Petioles (glabrous):			
Length	1.5-5.5 cm.	2-5 cm.	3-6 cm.
Acorns:			
Length of peduncle	4 mm.	0-5 mm.	8 mm.
Length of acorn	10-16 mm.	15-22 mm.	19-30 mm.
Outside height of cup	4-5 mm.	8-12 mm.	10-14 mm.
Width of cup	13-15 mm.	15-20 mm.	19-24 mm.
Cup-scales (closely appressed)	Small, smooth, light grayish brown	Large, smooth, grayish brown or silvery-gray	Large, tuberculate, grayish brown sometimes tinged with orange
Terminal Winter Buds:			
Length	5-7 mm.	3-5 mm.	5.5-8 mm.
Shape	Conic, slightly angled, ciliate on the imbricated scale margins	Ovoid, subterete, glabrous	Conic, slightly angled, puberulous or glabrous

Quercus mutabilis, the hybrid of the Pin Oak *palustris* and the Shumard Oak *shumardii*, was originally described by Palmer and Steyermark in 1935 in Vol. 22, P. 521, of the Annals of the Missouri Botanical Garden from a tree at Monteith Jct., Bates Co., Missouri. The brief description stated that it was intermediate in foliage and fruit between *palustris* and *shumardii* var. *schneckii*, its parents.

In his monograph "Hybrid Oaks of North America" (A.A.J. 29:35; 1948) E. J. Palmer stated that the leaves and fruit of this type tree resembled *shumardii* but that the leaves of some other specimens of their collection resembled *palustris*. He expressed the opinion that it is impracticable to distinguish which variety of a species is involved in a hybrid. Accordingly, the trees in Miquoria, hybrids of *palustris* and the type species *shumardii*, growing nearby, should be regarded as *mutabilis*. In this article Palmer cited localities in four counties in Missouri where *mutabilis* had been found. Mississippi is a fifth county. The ranges of *palustris* and *shumardii* overlap in ten other states, but no specimens of the hybrid *mutabilis* have been reported outside Missouri.

The A.F.A. champion *mutabilis* in Miquoria, with a circumference of 10'9" and rising to a height of 131' (as measured in 1955), is a most impressive tree, carrying a greater height in proportion to its girth than any other American Oak. It survived two tornadoes in 1957.

A dendrologist casting his eyes for the first time upon these magnificent specimens of *mutabilis*, with smooth bark exactly like *palustris* and deeply lobed leaves resembling *palustris*, can hardly believe that they are anything but *palustris*. But the careful morphological study at the beginning of this article shows that they are quite different.

It should not be taken for granted that it is an easy matter to distinguish between the ecotypes of *palustris* and *shumardii*. [3]The bark of *shumardii* is only slightly rough and the ridges are almost obscure. Its leaves are always deeply lobed and look much like *palustris* when viewed from the ground in their lofty crowns. The ecotype of *palustris* does not develop the "pins" and drooping branches generally characteristic of the species.

Examination of leaves in the field shows that the second lobe of the leaves of *mutabilis* narrows toward the apex and is often entire, whereas the lobe of *palustris* is constant in width and always (or nearly always) lobed and toothed. The leaf of *mutabilis* is broader at the base than *palustris* and more like *shumardii*. The midrib of *mutabilis* is yellow, resembling *shumardii*, whereas the midrib of *palustris* is tawny or pale.

The acorns of *palustris* and *shumardii* are very different in size and shape, and this fortunate fact provides a prominent morphological basis for distinguishing the acorns of *mutabilis*, which are intermediate between its parents. At the same time the acorns of different specimens of *mutabilis* vary greatly in their characters. There are at least three distinct types. One type has silvery-gray scales, a striking character not appearing in either of its parents.

Where the winter buds of the parents are distinctly different, the characters of the winter buds of the hybrid may be expected to be more or less intermediate and give a distinct clue to the parents. But in mutabilis this organ fails. The winter buds of palustris and shumardii are not very different, both being conic and acute or acuminate; but the typical buds of mutabilis are smaller, plump, rather blunt, and quite glabrous.

In Crataegus, where the growth rates of different series vary as much as tenfold, the growth rates of species believed to have originated as hybrids between species of different series provide a valuable clue to the parentage when compared with the growth rates of the putative parents. [4]But in mutabilis this test fails. An 8 year record of the growth rate of the champion mutabilis shows it grows at a substantially slower rate than either palustris or shumardii, as shown in the following table:

GROWTH RATE OF THE LARGEST OAK OF EACH KIND IN MIQUORIA

TAXON Quercus sp.	CIRCUM-FERENCE	HEIGHT	AVERAGE ANNUAL INCREMENT OF CIRCUMFERENCE Inches	LENGTH OF RECORD Growing Years
lyrata................	11'9"	......	.75	8
macrocarpa............	17'7"	127'	.6	4
michauxii.............	19'9"	......	1.1	8
palustris.............	13'4"	......	1.26	13.7
mutabilis.............	10'9"	131'	.75	8
shumardii.............	12'9"	......	1.5	6
falcata pagodaefolia..	11'9"	104'	1.2	11
falcata leucophylla...	14'4"	122'	2.5	6

Mutabilis is distributed thruout the NE¼ of Section 14, being a constituent of the [5]"Upper Mississippian Forest" type, but does not grow in the low bottoms. It seems to be more common than either of its parents. It is impossible to say how much farther its natural range may have extended, as all other timber in the Mississippi River bottoms has been destroyed, but it seems reasonable to assume that it ranged outside the present park.

The possibility of a relationship between mutabilis and Q. nuttallii cachensis Palmer of northeastern Arkansas deserves future investigation. The acorns of the champion mutabilis look very much like a picture of the acorns of nuttallii cachensis; but there seems to be a difference in the largest lobe of the leaves. Nuttallii does not grow in Miquoria and it is questionable whether it is found anywhere in Missouri.

[1] In Mississippi Co., Missouri near the Mississippi River; described in PHYTOLOGIA, Vol. 4, No. 3, Pp. 154-155. It is the only locality in the United States outside New England and eastern New York that is within fifty miles of four other states.

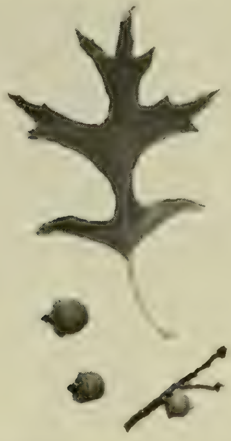
[2] "MIQUORIA" is a name coined by the author to take the place of "Big Oak Tree State Park," being brief, euphonious and descriptive. It is made up as follows: MI from Mississippi Co. and River; QU from Quercus; ORIA from Hicoria.

[3] The country people and retired lumbermen--unconcerned over the perplexities of taxonomy--call palustris, mutabilis and shumardii "water Oak." The true Water Oak, however, does not range so far up the Mississippi River.

[4] Cf. "Manual of the Hawthorns of Cook and Du Page Counties of Illinois" by Kendall Laughlin, Pp. 13, 17, 56, 57.

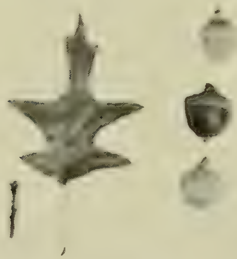
[5] "A Classification of Midwest Forest Types" by Kendall Laughlin; Trees Magazine July-Aug. 1952.

[6] "Ecotype" emphasizes the distinctive characters developed in a taxon by modification of its genotype in response to a more or less peculiar environment. The word has significance here because Miquoria is a climax forest.

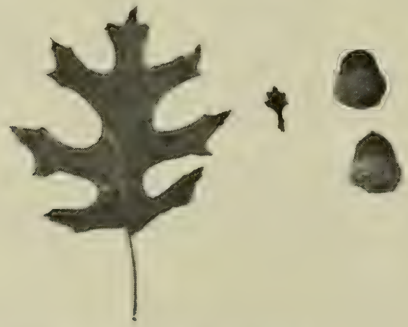


QUERCUS PALUSTRIS

29% of natural size



QUERCUS MUTABILIS



QUERCUS SHUMARDII

MEASURING THE HEIGHT OF TREES WITH THE ABNEY LEVEL

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The purpose of this article is to describe accurate methods by the use of hand instruments in measuring the heights of large trees. Such measurements can be made to an accuracy of 1 inch.

Textbooks on forest mensuration deal too lightly with the problem of the "lean" of a tree and fail to outline precise methods in measuring irregular trees. Tree monarchs are generally more than a century old. In battling storms they have lost limbs and often their leader and have grown up irregularly. In the case of deciduous trees the top is seldom in line with the trunk. If a measurement is taken to the trunk instead of the point beneath the top of the tree, the resulting error is so great that any measurements by instruments become a waste of effort.

The problem of measuring the height of a tree is actually the determination of the length of the perpendicular dropped from the top of the tree to a horizontal plane passing thru the base of the trunk. The first problem is to locate the point on the ground beneath the treetop. Place a tripod in the approximate (tentative) position beneath the treetop. It is necessary to use a tripod or standard of some kind instead of a stake because the distances are so great and the brush is generally so thick that a stake can not be seen. Stand in a position where the treetop can be seen as far as possible from the tree. Hold a vertical level in a position where the line of sight from the treetop touches the side of the level at its top. Follow the vertical line to the ground with your eye and move the tripod to a position where the vertical line passes thru the head of the tripod. Then move to a position about 90° distant, make the same observation of the treetop, and move the tripod so that its head is in line with this vertical line, keeping it in the same vertical plane as in the original location. This final position of the tripod is the point beneath the treetop and is actually the point near the ground on the line of intersection of the two vertical planes. Drop a plumb bob from the head of the tripod to the ground.

After thus locating the point beneath the treetop, the next problem is to measure the length of this vertical line. Various methods are presented, depending on the configuration of the foliage and the topography.

IF THE TREETOP CAN BE SEEN AT AN ANGLE OF 45° AND THE GROUND IS LEVEL OR DOES NOT SLOPE MUCH

Clamp the Abney level at a tangent of 1.00 (100 on the scale). Stand in a position where the treetop and the bubble show up together. Place a stake between your legs. Measure the horizontal distance from this stake to the point beneath the treetop. This is one leg of an isosceles right triangle and is the equivalent of the vertical line extending from the treetop to the horizontal level of your eye.

The next problem is to determine the vertical distance of your eye above the base of the trunk. Place a 6 foot ruler against the trunk in as nearly a vertical position as possible. Hold it in position at the top by sticking an awl into the tree 2 inches below the top of the ruler on one side and another awl 4 inches below the top on the other side. These awls hold the ruler in place and also serve as visual guides in reading distances on the ruler. Clamp the Abney level at 0 elevation (horizontal), sight thru it and read the number of inches above the ground on the ruler. This is the height of your eye above the base of the tree.

In looking at the treetop your head was tilted back and your eyes were 2 inches higher than when looking horizontally.

The height of the tree is the height of your eye above the base of the tree plus 2 inches plus the height of the treetop above the level of your eye.

IF THE TREETOP CANNOT BE SEEN AT AN ELEVATION OF 45° AND THE GROUND IS LEVEL OR DOES NOT SLOPE MUCH

If intervening foliage cuts off the sight of the treetop so that it cannot be seen at an angle of 45° in any position, the problem is still relatively simple.

Stand in a position as close to the tree as the top can be seen and read the tangent on the Abney level. Place a stake between your legs. Measure the horizontal distance from this stake to the point beneath the treetop.

$$\tan = \frac{\text{height}}{\text{horizontal distance}}$$

height = tan x horizontal distance. This is the height of the treetop above the level of your eye.

The height of your eye above the base of the tree is ascertained as in the preceding case. The total height is the height of your eye above the base of the tree plus 2 inches plus the height of the treetop above the level of your eye.

IF THE GROUND SLOPES UPWARD MORE THAN 6 FEET FROM THE BASE OF THE TREE

If the slope is so great that the horizontal line from your eye passes above the top of a 6 foot ruler held against the tree, an accurate measurement by tape of the horizontal distance to the point beneath the treetop usually cannot be taken, and if this is the case, it is necessary to solve two or three triangles.

The problem is illustrated in Fig. 1. Stand in any position G where you can see the treetop. In this case use the degree scale on the Abney level. Point the Abney level at the treetop A and read the angle F. Point the Abney level at the point on the ground B touched by the plumb bob hanging from the tripod and read the angle E. Place a stake between your legs and measure the rectilinear distance d along the ground from this stake to the plumb bob B. It is necessary to know the height of your eye c above the ground when looking downward; if you know the height of your eye when looking horizontally, subtract 1 inch therefrom.

(1) $D = 90^\circ - E$

In the oblique triangle BDG, by the law of the sines:

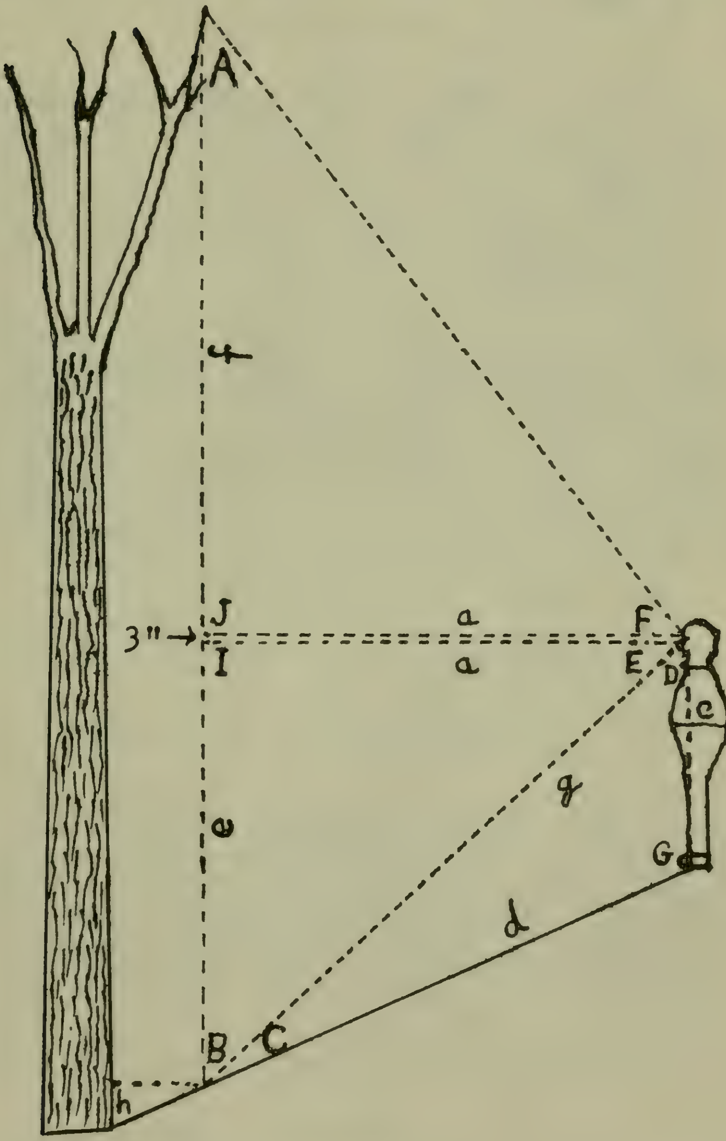

Fig. 1

$$\frac{c}{d} = \frac{\sin C}{\sin D}$$

$$c \sin D = d \sin C$$

$$(2)\ \sin C = \frac{c \sin D}{d}$$

$$(3)\ G = 180^\circ - (C + D)$$

$$\frac{g}{c} = \frac{\sin G}{\sin C}$$

$$g \sin C = c \sin G$$

$$(4)\ g = \frac{c \sin G}{\sin C}$$

We are seeking e and f in the right triangles BEI and AFJ, each of which has a leg a. These triangles are separated by a distance of 3 inches, representing the difference in the elevation of your eye when looking upward and when looking downward. These two triangles can be solved separately for e and f. Knowing E and g in the triangle BEI, we can solve for e and a. If angle F is 45°, $f = a$. But if angle F is not 45°, instead of solving the two triangles separately, the procedure can be shortened by moving the two triangles together geometrically to make the oblique triangle ABD and solving for $e+f$ as follows:

$$(5)\ A = 90^\circ - F$$

$$\frac{g}{e + f} = \frac{\sin A}{\sin (E + F)}$$

$$(e + f) \sin A = g \sin (E + F)$$

$$(6)\ e + f = \frac{g \sin (E + F)}{\sin A}$$

The point B where the plumb bob touches the ground will probably not be on the same horizontal level as the base of the tree and it will be necessary to make an adjustment for the height h above (or possibly below) the level of the base of the tree. This can be done by extending a ruler or steel tape, held in a horizontal position by means of a level, from B to the tree trunk and measuring the vertical distance h on the tree trunk from this point to the base of the tree.

The height of the tree is h plus e plus f plus 3 inches.

MATERIALS TOWARD A MONOGRAPH OF THE GENUS CITHAREXYLUM. IV

Harold N. Moldenke

CITHAREXYLUM FRUTICOSUM var. SMALLII Moldenke

This variety is named in honor of the late Dr. John Kunkel Small (1869—1938), whose devoted lifetime of work on the fascinating flora of the southeastern United States will ever remain a dignified monument to his memory, whose scholarly researches in the Polygonaceae, Oxalidaceae, Cactaceae, Arecaceae, and many other plant groups in the North American flora form a priceless contribution and much-needed stimulus to the scientific understanding of these groups, and whose ardent adherence, often in the face of bitter and cruel opposition, to the principles in which he so firmly believed in the fields of botanical nomenclature and taxonomy has won him the admiration and respect of his colleagues, who would consider it a great honor and privilege to be able to follow in his footsteps and many of whom wish that they had the courage to do so. Dedicated and sincere scientists, like Dr. Small, with views at variance to those of the majority in their field of research, are urgently needed if science is to progress and not stagnate due to the lethargy and laissez-faire attitude of the majority.

The typical form of the variety is from Andros island and is well exemplified by Brace 4898, 5140, 6724, and 7062 and by Small & Carter 8583. The Eleuthera island specimens (E. G. Britton 6402; Britton & Millspaugh 5615) have somewhat broader leaves, but otherwise agree well with Northrop & Northrop 608 from Andros. The specimens from East Caicos island (Millspaugh & Millspaugh 9065) and Long island (Coker 814) have broader leaves and approach the narrower-leaved forms of typical C. fruticosum. In all, 36 herbarium specimens, including the type and 5 mounted photographs, have been examined.

Citations: BAHAMAS: Brace 4898 (F—199930, N), 5140 (F—200156, N), 6724 (F—214139, N), 7062 (F—214458, N, N); E. G. Britton 6402 (F—213913, F—213914, N); Britton & Millspaugh 5615 (F—198441, N); W. C. Coker 226 (N), 814 (N); Millspaugh & Millspaugh 9065, in part (F—287819, N); Northrop & Northrop 608 (B, B, C, F—130695, G, K, N, X); Small & Carter 8583 (B—isotype, B—photo of type, D—555871—isotype, F—283602—isotype, G—isotype, K—isotype, K—photo of type, N—type, N—photo of type, P—isotype, S—photo of type, W—758011—isotype, Z—photo of type). CUBA: Oriente: Hioram 3956 (Ha), s.n. [Julio 1920] (Sc).

CITHAREXYLUM FRUTICOSUM var. SUBSERRATUM (Sw.) Moldenke, Phytologia 1: 17. 1933.

Synonymy: Citharexylon subserratum Sw., Prodr. Veg. Ind. Occ. 91. 1788. Citharexylum subserratum Sw. apud Gmel. in L., Syst.

Nat., ed. 13, 2 (2): 943. 1796. *Citarexylum fruticosum* var. *subserratum* (Sw.) Moldenke apud Alain in León & Alain, Fl. Cuba 4: 300, sphalm. 1957. *Citarexylum subserratum* Sw. apud Alain in León & Alain, Fl. Cuba 4:300, in syn. 1957.

Literature: Jacq., Ic. Pl. Rar., ed. 1, 1: 4, pl. 82 (1781) and ed. 2, 1: 12, pl. 118. 1786; Jacq., Collect. Bot. 1: 72. 1786; Sw., Prodr. Veg. Ind. Occ. 91. 1788; Gmel. in L., Syst. Nat., ed. 13, 2 (2): 943. 1796; Lam., Tabl. Encycl. Méth. 3: pl. 545, fig. 2. 1797; Pers., Syn. Pl. 2: 142. 1806; Poir. in Lam., Encycl. Méth. Bot. Suppl. 2: 368. 1811; Poir. in Lam., Dict. Sci. Nat. 9: 286. 1817; Steud., Nom. Bot., ed. 1, 202. 1821; Spreng., Syst. Veg., ed. 16, 2: 764. 1825; Steud., Nom. Bot., ed. 2, 1: 375. 1840; Walp., Repert. 4: 74. 1845; Schau. in A. DC., Prodr. 11: 614. 1847; Griseb., Fl. Brit. West Ind. 497. 1861; Jacks., Ind. Kew. 1: 550. 1893; Fawcett, Prov. List Indig. Nat. Fl. Pl. Jamaic. 30. 1893; Moldenke, Phytologia 1: 17. 1933; Moldenke, Alph. List Common Names 14 & 24. 1939; Moldenke, Geogr. Distrib. Avicenn. 5, 7, & 36. 1939; Moldenke, Suppl. List Common Names 6. 1940; Moldenke, Prelim. Alph. List Invalid Names 15. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 24, 26, 71, & 88. 1942; Moldenke, Alph. List Invalid Names 13. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 39, 74, 102, 118, 188, 274, 275, 284, 306, & 320 (1946) and 2: 403, 408, 434, 487, 501, 507, 566, 581, & 647. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 43, 47, 157, & 179. 1949; Moldenke, Alph. List Cit. 3: 653, 654, 756, 760, 769, & 774 (1949) and 4: 983, 1028, 1038, & 1054. 1949; Alain in León & Alain, Fl. Cuba 4: 300. 1957.

Illustrations: Lam., Tabl. Encycl. Méth. 3: pl. 545, fig. 2. 1797.

This variety differs from the typical form of the species in that its leaf-blades are undulate, sinuate, subserrate, or even distinctly and sharply serrate along the margins from the apex to about the middle. The blades are mostly glabrous, often more or less impressed-punctate beneath, varying to sparsely villous-pubescent beneath. They are mostly obtusely rounded, emarginate, and sharp-serrate at the apex (acute on non-serrate leaves), and smaller (2—6 cm. long and 1.5—3.5 cm. wide) than in the typical form.

The type of the variety was collected by Olaf Peter Swartz on the island of Hispaniola, probably in what is now the Dominican Republic, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. The variety is apparently limited to eastern Cuba and Hispaniola, although it is also known in the cultivated state elsewhere. Grisebach reports it from Jamaica on the basis of a March collection. This collection, however, is probably the one cited by me under typical *C. fruticosum* L. Grisebach's description of the leaves as merely "repand-entire" seems to lend support to this contention.

The variety has been confused in the past with *C. pentandrum* Vent., *C. caudatum* L., and *C. fruticosum* var. *villosum* (Jacq.) O. E. Schulz, and was misidentified by Lamarck as *Volkameria* serrata L. [=Clerodendrum serratum (L.) Moon]. It inhabits pinelands, arid plains, dry mountainsides, savannas, and woods, and has been found along roadsides and among rocks, ascending to 2750 feet altitude. It is described as a shrub or tree, 5—12 feet tall. Its racemes, like those of var. smallii Moldenke, are mostly abbreviated. The flowers are white, and the fruit is "red and black". It has been collected in anthesis in January, February, July, and August. Common names recorded are "citharexylum denticulé", "cotelet denticulé", "grenarde", "grenardo", and "palo santo".

The teeth in many cases, as in the type specimen, are limited to the rounded leaf-apex, where they stand erect and vary from 2 to 6 in number. This condition is well illustrated by Nash & Taylor 1245, which matches the type perfectly. On the other hand, Leonard & Leonard 13459 represents a form with the teeth large and coarse, borne at the sides of the leaf rather than at the apex. Leonard & Leonard 13154 represents a form with merely undulate or sinuate leaf-margins and may possibly be the form referred to by Grisebach. In the type collection the leaf-blades are subvillous-pubescent along the larger venation beneath, but in all the other specimens cited below they are glabrous or subglabrate beneath and more or less impressed-punctate. The Cuban collection is said to be taken from a shrub 3 meters tall; its leaves all have small erect teeth near their apex only.

The variety often has its trunk attacked by the fungus Lenzites gussonei Scalia and by Irene longipoda (Gaill.) Toro. The plant described and figured by Jacquin in his Ic. Pl. Rar. pl. 82 & 118 (1781 and 1786) and his Collect. Bot. (1786) appears to be much like var. subserratum, but the former, at least, is actually the type of his var. villosum.

In all, 47 herbarium specimens, including the types of all the names involved, and 7 mounted illustrations and photographs have been examined.

Citations: CUBA: Oriente: León 11864 (Ha). HISPANIOLA: Dominican Republic: Bertero s.n. [S. Domingo, 1821] (Dc); Swartz s.n. (B—photo of type, Bm—isotype, K--photo of type, N—photo of type, S—type, Z—photo of type). Haiti: W. Buch 1089 (B, S); Christ 2159 (B); Ekman H.310 (B, S), H.803 (B, S); E. C. Leonard 8926 (Ca—318036, F—574252, W—1300256); Leonard & Leonard 13154 (A, N, W—1451831), 13459 (N, W—452110); Nash & Taylor 1245 (B, F—185304, N), 1314 (B, E—805280, F—185305, N), 1328 (B, F—185306, N, N—photo, W—792207, Z—photo), 1690 (F—185307, N). WEST INDIES: Island undesignated: Herb. Adanson s.n. (P, P); Herb. Rottböll. s.n. (Cp); Herb. Mus. Bot. Berol. s.n. (B); Nuttall s.n. (D). CULTIVATED: France: Herb. Baillon s.n. [H. P., 16 Aout 1866] (P); Herb. Büttner s.n. (B); Herb. Hort. Paris. s.n. (Br); Herb. Jard. des Plantes s.n. (Mu—1385). Reunion: Néraud s.n. (Cb). Scotland: Herb. Univ. Edinb. s.n. (Ed).

LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated s.n. (Dc); Herb. A. L. Jussieu 5092 (P, P); Herb. Lamarck s.n. (P). MOUNTED ILLUSTRATIONS: Lamarck, Illustr. pl. 546, fig. 2 (Cb).

CITHAREXYLUM FRUTICOSUM var. SUBVILLOSUM Moldenke in Fedde, Repert. 37: 223. 1934.

Synonymy: Citharexylum fruticosum var. angustifolium Griseb. ex Moldenke, Alph. List Invalid Names 14, in syn. 1942. Citharexylum fruticosum var. pentandrum Duchass. ex Moldenke, Alph. List Invalid Names 14, in syn. 1942. Citarexylum fruticosum var. subvillosum Moldenke apud Alain in León & Alain, Fl. Cuba 4: 300, sphalm. 1957.

Literature: Moldenke in Fedde, Repert. 37: 223. 1934; Moldenke, Lilloa 4: 312. 1939; Moldenke, Alph. List Common Names 8, 13, & 24. 1939; Moldenke, Geogr. Distrib. Avicenn. 3—10, 12, & 36. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 4, 5, 24—28, 30, 33, 71, & 88. 1942; Moldenke, Alph. List Invalid Names 14. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 26, 51, 52, 55, 60—63, 65, 66, 137, 140, 167, 179—182, 184—186, 190, 198, 204, 207, 208, 260, 261, 272, 281, 282, 294, 299, 302, 305—310, & 315 (1946), 2: 333, 336, 338, 355, 395, 402, 419, 420, 423, 425, 443, 466, 487, 509, 512, 513, 521, 543, 544, 548, 549, 559, 581, 612, 631, 640, 646, & 647 (1948), 3: 654, 739, 751, 756, 771, 789, 801, 810, 825, 826, 853, 867, 870, 888, 889, 902, 906, 917, 928, 929, 936—938, & 944 (1949), and 4: 1008, 1017, 1018, 1020, 1023, 1027, 1033, 1035—1037, 1039, 1042, 1047, 1057, 1063, 1065, 1085, 1087, 1111, 1117, 1143, 1144, 1158, 1177, 1206, 1236, & 1296. 1949; Moldenke, Phytologia 3: 140. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 9, 42, 43, 46, 47, 49—51, 54, 57, 68, 157, & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Moldenke, Journ. Calif. Hort. Soc. 15: 85. 1954; Moldenke in Cheesman, Pl. Trin. & Tob. 2 (6): 21—22. 1955; Alain in León & Alain, Fl. Cuba 4: 300. 1957.

This variety differs from the typical form of the species in that its leaf-blades are roughened-scabridous, densely puberulent, or very short-pubescent beneath or else subvillous along the midrib and secondaries. Its racemes are mostly abbreviated.

The type of the variety was collected by Nathaniel Lord Britton (no. 2101) in a thicket at Fisherman's Point, Guantanamo Bay, Oriente, Cuba, between March 17 and 30, 1909, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is said to inhabit arid thickets, hillside thickets, forests, hammocks, hillsides, low calcareous ground, sand, coastal coppice, and the scrub on coral limestone near the sea. Collectors describe it as a shrub 2—3 feet tall or even as a tree to 8 meters in height. It has been collected in anthesis in January, March, June, September, and October, and in fruit from November through March and in June and September. It has been found from sea level to 530 meters altitude.

It has hitherto been confused with var. villosum (Jacq.) O. E.

Schulz, which it sometimes approaches in characters, and, of course, with the typical form of C. fruticosum L. Herbarium specimens have been misidentified as C. cinereum L. [=C. fruticosum], C. spinosum L., C. quadrangulare Jacq. [=C. spinosum], C. albicaule Turcz., C. subserratum Sw. [=C. fruticosum var. subserratum (Sw.) Moldenke], C. villosum Jacq. [=C. fruticosum var. villosum], C. bahamense Millsp. [=C. fruticosum var. villosum], C. pulverulentum Pers. [=C. pentandrum Vent.], and Tabernaemontana citrifolia L. (in the Apocynaceae).

León 11393 has its leaves all very coarsely dentate to below the middle, but was apparently taken from coarse watersprouts, as León humself suggets on the label. The Harshberger s.n. [August 12, 1911] collection exhibits only a few hairs in the axils of the leaf-blades, and may actually be the typical form of the species instead of this variety. A piece of the bark is preserved on the sheet of Britton, Britton, & Shafer 41 at Chicago.

The variety exists in cultivation in Hale Plaza, Laguna and Pedregosa Streets, Santa Barbara, California. Vernacular names recorded for it are "arbol gándul", "árbol gándul", "cateycillo", "gallito", "heuvo de gallo", "huevo de gallo", "penda", "pendula blanca", and "roble amarillo". Of these, however, "cateycillo", "gallito", and "roble amarillo" are also applied to typical C. fruticosum, and "penda" is applied to C. fruticosum, C. fruticosum var. villosum, C. caudatum L., C. spinosum, and Cornutia pyramidata L. In all, 183 herbarium specimens, including the types of all the names involved, and 5 mounted photographs have been examined.

Citations: FLORIDA: Dade Co.: E. J. Alexander s.n. [Hattie Bauer Hammock, May 1930] (N); N. L. Britton 40 (F—172645, N), s.n. [January 21st, 1905] (Ur); H. C. Cowles S.20-20, in part (Ob—61487); Fennell 214 (Ar—15867); A. P. Garber s.n. [Miami, Feb.—July 1877] (D—753740); Harshberger s.n. [August 12, 1911] (Up—63374); A. S. Hitchcock s.n. [Miami, Mar. 1903] (F—231804); Mosier s.n. [Aug. 1928] (N); E. J. Palmer 27501 (A, E—931097); Safford & Mosier 95 (W—1035978), 228 (W—1036068); E. Scull s.n. [Long Pine Key, 6/14/37] (Fl—27400), s.n. [Royal Palm State Park, 6/14/37] (Bt—46026); Small & Small 4719 (H—43165, N, S). Monroe Co.: Blodgett s.n. [Key West] (Du—177394); Cuthbert s.n. [Key West, May 6, 1919] (Fl—20946); L. E. Scull s.n. [Big Pine Key, 1/21/40] (Fl—31503); J. H. Simpson 478 (C, G, W—57464); E. West s.n. [Key West, 11-21-30] (Fl—20950, Fl—20951). Palm Beach Co.: A. S. Hitchcock 1488 (F—233565); H. J. Webber 431 (F—228556). BAHAMAS: Boos s.n. (V); Brace 1882, in part (F—185993); Britton & Brace 499 (B, F—171896, N); Britton & Millspaugh 233a (W—429736); Millspaugh & Millspaugh 9065, in part (W—1476416). CUBA: Havana: Baker & Van Hermann 1958, in part

(Es, F—185601, G, N, W—845391); A. S. Hitchcock s.n. (F—235035); Lane 435 (K); León 6247 (Ha), 6255 (Ha), 7156 (Ha), 11393 (Ha); Schott 89 (Bm, F—41518, N, W—57326); Van Hermann 5067 (Es), 5069 (B, F—189253, N, Po—63523). Oriente: Acuña 13329 (Es, N), 17181 (Es); N. L. Britton 2101 (B--photo of type, K--photo of type, N--type, N—photo of type, S—photo of type, W—847748—isotype, Z—photo of type); Clément 3015 (Ha, N); Ekman 1367 (S), 4160 (S), 8638 (N), 9431 (S, S); Ekman & León 14727 [Herb. Roig 5785] (Es); Hioram 3956 (N); Pollard, Palmer, & Palmer 28, in part (Cm, E—119074); Roig 1596 (Es); Shafer 7924 (N, Ut, W—696434); C. Wright 438 (G, N, Pa, S, W—57319, X). Province undetermined: Sagra 207 (B, Bm, L, N), s.n. (B, N, P, P, P, V, V, V); C. Wright 349/1 [Herb. Sauvalle 1860] (Hv), 583/1 [71; Herb. Sauvalle 1769, in part] (Hv), 3663 (B, C, F—185308, G, K, Pa, S, W—57320), s.n. [1865; Herb. Sauvalle 1766, in part] (Hv). JAMAICA: W. Hooker s.n. (P, P). HISPANIOLA: Dominican Republic: Eggers 2389 (B, C, Vu, W--1323189); Ekman H.16013 (B, F—839504, S). Haïti: Leonard & Leonard 12075 (A, Cm, N, W--1450924). PUERTO RICO: Sintenis 2085 (B, B, Io—75746, L, Lu), 3418 (B, Cb, L, Le). CULEBRAS: Britton & Wheeler 215 (F—201249, N, N, W—655874, W—847273). VIRGIN ISLANDS: Anegada: Britton & Fishlock 1043, in part (K). St. John: Eggers 3054 (Ol). St. Thomas: Britton, Britton, & Shafer 41 (B, D—555938, E--720781, F—407747, K, N, W—757557); Curran 788 (F--740469), 828 (N); Duchassaing s.n. (E—119097); Eggers 661 (A, P, P), s.n. [16 June, 1876] (G), s.n. [St. Th., Novb. '80] (Pa), s.n. [July 1881] (W—1323190), s.n. [Jan. 1887] (B); C. A. Ehrenberg 198 (B); Herb. Grisebach s.n. (B); Paulsen 156 (F—131505); L. C. Richard s.n. (P); J. N. Rose 54 (A, F—689839, Us). Tortola: Shafer 1150 (F—407912, N, W—756859). Virgin Gorda: Fishlock 277 (W—1146832). LEEWARD ISLANDS: Dominica: Eggers s.n. [May 1881] (B). Guadeloupe: Duchassaing s.n. (B). St. Bartholomew: Forsström s.n. [Ins. St. Bartholomew] (S, S, S); Herb. Mus. Bot. Lund s.n. [Barthel.] (Lu). TRINIDAD: C. King s.n. [Trin. Bot. Gard. Herb. 7224] (N). WEST INDIES: Island undetermined: Collector undesignated s.n. (P); Eggers s.n. [1885] (Mi); Herb. Jewett s.n. (Mi); Herb. Mus. Bot. Berol. s.n. (B); Schlechtendal 2128 (S). FRENCH GUIANA: Leblond 281 (Cb). CULTIVATED: California: Popenoe 625 (Ar—1786). Cuba: Acuña 15310 (Es, N). France: Perrottet s.n. [Jard. Pl. de Paris, 1818] (Cb). India: Herb. Bot. Gard. Saharanpore s.n. (W--281994). Italy: Herb. Jard. de Florencia s.n. (Cb). New York: Hartling s.n. [N. Y. Bot. Gard. Cult. Plants 12116] (N, Ur). LOCALITY OF COLLECTION UNDESIGNATED: Herb. Mus. Bot. Stockholm 14 (S).

CITHAREXYLUM FRUTICOSUM var. VILLOSUM (Jacq.) O. E. Schulz in Urb., Symb. Ant. 6: 63. 1909.

Synonymy: *Citharexylum villosum* Jacq., Ic. Pl. Rar. 1: 12, pl. 118. 1786 [not *C. villosum* Donn. S., 1907]. *Citharexylum molle* Salisb., Prodr. 108. 1796 [not *C. molle* Jacq., 1804, nor H.B.K., 1818, nor Hook., 1940]. *Citharexylum tomentosum* Poir. in Lam., Encycl. Méth. Suppl. 2: 368. 1811 [not *C. tomentosum* H.B.K., 1817, nor Sessé & Moc., 1831]. *Citharexylon villosum* Jacq. ex Steud., Nom. Bot., ed. 1, 202. 1821. *Citharexylon tomentosum* Poir. ex Steud., Nom. Bot., ed. 1, 202. 1821. *Citharexylum villosum* f. *angustifolium* Griseb., Syst. Untersuch. Veg. Kar. 108. 1857. *Citharexylum polystachyum* Turcz., Bull. Soc. Nat. Imp. Mosc. 36 (3): 209. 1863. *Citharexylon bahamense* Millsp. in Britton, Bull. N. Y. Bot. Gard. 3: 450—451. 1905. *Citharexylum bahamense* Millsp. apud Prain, Ind. Kew. Suppl. 3: 43. 1908. *Cithavexylon villosum* Jacq. ex Britton, N. Amer. Trees 825, sphalm. 1908. *Citharexylum pentandrum* Cham. apud O. E. Schulz in Urb., Symb. Ant. 6: 63, in syn. 1909 [not *C. pentandrum* Vent., 1800]. *Citharexylum buekii* Fischer, in part, ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. *Citharexylum floridanum* Rugel ex Moldenke, Alph. List Invalid Names 15, in syn. 1942. *Vitharexylum fruticosum* var. *villosum* (Jacq.) O. E. Schulz ex Moldenke, Alph. List Cit. 1: 160, sphalm. 1946. *Citharoxyllum villosum* Jacq. ex Moldenke, Alph. List Invalid Names Suppl. 1: 5, in syn. 1947. *Citharexyllum villosum* Jacq. ex Moldenke, Alph. List Invalid Names Suppl. 1: 5, in syn. 1947. *Citharexylum pilosum* Jacq. ex Moldenke, Alph. List Invalid Names Suppl. 1: 5, in syn. 1947. *Citharexylum frutucosum* var. *villosum* (Jacq.) O. E. Schulz ex Moldenke, Alph. List Cit. 2: 434, sphalm. 1948. *Citharexylum fruticosum* Schult. ex Roig, Dicc. Bot. 1: 823, in syn. 1953 [not *C. fruticosum* L., 1759]. *Citarexylum fruticosum* var. *villosum* (Jacq.) O. E. Schulz apud Alain in León & Alain, Fl. Cuba 4: 300, sphalm. 1957. *Citarexylum villosum* Jacq. apud Alain in León & Alain, Fl. Cuba 4: 300, in syn. 1957. *Citarexylum polystachyum* Turcz. apud Alain in León & Alain, Fl. Cuba 4: 300, in syn. 1957. *Citharexylum ciliare* Moran, in herb.

Literature: Jacq., Ic. Pl. Rar., ed. 1, 1: 4, pl. 82 (1781) and ed. 2, 1: 12, pl. 118. 1786; Jacq., Collect. Bot. 1: 72. 1786; Gmel. in L., Syst. Nat., ed. 13, 2 (2): 943. 1796. Salisb., Prodr. 108. 1796; Vent., Descr. Pl. Nou. Jard. Cels. pl. 47. 1800; Pers., Syn. Pl. 2: 142. 1806; Poir. in Lam., Encycl. Meth. Suppl. 2: 368. 1811; Poir. in Lam., Dict. Sci. Nat. 9: 285. 1817; Steud., Nom. Bot., ed. 1, 202. 1821; Spreng. in L., Syst. Veg., ed. 16, 2: 763—764. 1825; Desf., Cat. Pl. Hort. Reg. Paris, ed. 3, 91. 1829; Steud., Nom. Bot., ed. 2, 1: 375. 1840; Walp., Repert. 4: 761. 1845; Schau. in A. DC., Prodr. 11: 610—

611. 1847; Griseb., Abhand. König. Gesell. Wissen. Götting. 7: 256. 1857; Griseb., Syst. Untersuch. Veg. Kar. 108. 1857; Agardh, Theor. Syst. Pl. pl. 22. 1858; Turcz., Bull. Soc. Nat. Imp. Mosc. 36 (3): 209. 1863; Bocq., Rev. Verb. pl. 13. 1863; Chapm., Fl. South. U. S., ed. 2, 309. 1889; Jacks., Ind. Kew. 1: 550. 1893; Sarg., Silva N. Amer. 6: pl. 295. 1894; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 157 & 159. 1894; Britton, Bull. N. Y. Bot. Gard. 3: 450—451. 1905; Sarg., Man. Trees N. Amer. 788. 1905; Prain, Ind. Kew. Suppl. 3: 43. 1908; O. E. Schulz in Urb., Symb. Ant. 6: 59—60 & 63. 1909; Britton & P. Wils., Scient. Surv. Porto Rico 6: 145. 1925; Sudw., Check List For. Trees U. S. 231. 1927; Roig, Est. Exp. Agron. Santiago Vegas Bol. 54: 794. 1928; Stapf, Ind. Lond. 2: 220. 1930; Moldenke, Phytologia 1: 17. 1933; Moldenke, Alph. List Common Names 5, 10, 12, 14, 24, & 33. 1939; Moldenke, Geogr. Distrib. Avicenn. 3—11 & 36. 1939; Moldenke, Suppl. List Common Names 6. 1940; Moldenke, Prelim. Alph. List Invalid Names 15—18. 1940; Questel, Fl. Isl. St-Barthol. 179. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 5, 24—29, 71, & 88. 1942; Moldenke, Alph. List Invalid Names 13—15. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 24, 26, 27, 33, 39, 40, 46, 51, 55, 59, 61—66, 82, 98, 102, 103, 109, 112, 115, 117, 118, 120, 122, 131, 135, 141, 152, 160, 178, 183—185, 188, 189, 204, 207, 208, 212, 238, 240, 241, 272, 285, 286, 297, 298, 302—309, & 313—315. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 5. 1947; Moldenke, Alph. List Cit. 2: 333, 335, 352, 356, 358, 403, 404, 407, 408, 415, 419, 420, 425, 427, 429, 434—437, 443, 447, 448, 459, 465, 482, 484, 490, 503, 504, 524, 528, 543—545, 549, 554, 561, 562, 569, 579, 581, 640, 649, & 652 (1948), 3: 654, 717, 749, 750, 756, 757, 759, 774, 783, 789, 810, 813, 825, 836, 841, 842, 853, 856, 867, 880, 885, 889, 894, 930, 943, & 970 (1949), and 4: 983, 1016, 1020, 1026, 1027, 1029, 1033, 1035, 1036, 1038, 1039, 1045, 1047, 1049, 1052, 1054, 1057, 1061—1063, 1068, 1082, 1106, 1137, 1206, 1231, 1232, & 1304. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 9, 42, 43, 46, 47, 49—52, 54, 55, 157, & 179. 1949; Roig, Dicc. Bot. 1: 823 and 2: 1003. 1953; Moldenke, Journ. Calif. Hort. Soc. 15: 85. 1954; Alain in León & Alain, Fl. Cuba 4: 300. 1957.

Illustrations: Jacq., Ic. Pl. Rar., ed. 1, 1: pl. 82. 1781; Jacq., Ic. Pl. Rar. 1: pl. 118 (colored). 1786; Agardh, Theor. Syst. Pl. pl. 22. 1858; Bocq., Rév. Verb. pl. 13. 1863; Sarg., Silva N. Amer. 6: pl. 295. 1894; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 157. 1894; Sarg., Man. Trees N. Amer., ed. 1, 788. 1905.

This variety differs from the typical form of the species in that its leaf-blades are densely velutinous-pubescent or villous-pubescent beneath. This velutinous villosity often extends to a greater or less degree to the upper surface of the blades, the petioles, peduncles, rachis, pedicels, calyx, fruiting-calyx, twigs, and branchlets. The plant is described as a tree, to 25 feet tall, the trunk to 7 inches in diameter, the corolla white and pilose, and the fruit blackish.

The type of the variety was collected from a cultivated plant in the botanical garden at Vienna, Austria, apparently grown from seed sent from Santo Domingo. The type of C. bahamense is Britton & Brace 233 from a coppice on Farrington Road, New Providence island, Bahamas, while that of C. polystachyum is Linden 1975 from Santiago to Río Guasso, Cuba. The type of C. tomentosum Poir. was collected on the island of St. Thomas and is preserved in the Desfontaines herbarium. Poiret in his original description admitted that he was unacquainted with C. villosum Jacq. and that his plant seemed to be very close to that of Jacquin.

Common names recorded for the plant are "bois coteletta", "citharexylum velu", "cotelet tomenteux", "cotelet velu", "cutlet", "fiddle wood", "fiddlewood", "grenard", "penda", "pende", "roble amarillo", and "white fiddlewood". Of these, "bois coteletta" is applied also to C. fruticosum var. brittonii Moldenke, "roble "amarillo" to C. fruticosum L., "cutlet" to C. fruticosum, C. fruticosum var. brittonii, and C. spinosum L., "penda" to C. caudatum L., C. fruticosum, C. fruticosum var. subvillosum Moldenke, C. spinosum, and Cornutia pyramidata L., "white fiddlewood" to C. caudatum, C. fruticosum, C. fruticosum var. brittonii, Vitex capitata Vahl, and V. compressa Turcz., and "fiddlewood" to C. fruticosum, C. fruticosum var. brittonii, C. spinosum, Cornutia pyramidata, Petitia domingensis Jacq., Vitex gaumeri Greenm., and V. umbrosa Sw. The name "cotelet tomenteux" was by error ascribed to C. tomentosum H.B.K. by me in my Suppl. List Common Names 6 (1940).

Material of this variety has often been confused in herbaria with C. cinereum L. [=C. fruticosum], C. teres Jacq. [=C. spinosum], C. caudatum, and C. fruticosum itself. The variety is widely cultivated in botanical gardens. Some specimens are truly remarkable for the density and widespread occurrence of the velutinous villosity over the plant. Some specimens, however, such as Valeur 112, vary in their characters toward var. subvillosum, while others, like Valeur 662, are very typical and if seen alone and compared with the typical form of C. fruticosum would certainly be said to represent a distinct species by most impartial observers. Every intermediate form, however, exists, most of which are herein referred to var. subvillosum. Leonard 4991 is remarkable in having terminal racemes 30 cm. in length! Britton, Britton, & Brown 5838 represents a shoot with deeply and coarsely dentate leaf-blades. A similar shoot is seen on Ekman H.1372 in the United States National Herbarium, while a very few, scattered, small, slender, sharp, subapiculate teeth appear on the leaves of the type specimen as well as on Boos s.n., Ehrenberg s.n., and some other collections. Dentate leaves are found on Christ 1909, 1911, and 1981, Picarda 531, and Bertero 607, while the cultivated specimen from Denmark has its leaf-blades even more strongly dentate than those on the type specimen. The Copenhagen sheet of Raunkiaer 878 represents a vigorous shoot whose leaves are remarkable in being caudate-acuminate at the apex.

The plant is said by collectors to inhabit copses, thickets, roadsides, rocky hillsides, scrubland, coastal thickets, coastal cliffs, pine forests, semi-arid pine regions, and woods along the coast, ascending to 400 meters altitude. It has been collected in anthesis in March, May, and June, and in fruit in February, March, and June. Valeur refers to the fruit as "blackish". Millspaugh regards *Nash 991* as very typical of the variety. In the Bahamas it is known from Abaco, Cat, New Providence, and Watling islands.

Grisebach's *C. villosum* var. *pentandrum* is often included in the synonymy of this taxon, but appears to be based on *C. pentandrum* Vent. and therefore belongs in the synonymy of that species instead. O. E. Schulz in Urb., Symb. Ant. 6: 63 (1909) cites a "Jacq., Ic. Pl. Rar., ed. 1, 4, pl. 82. 1781", but this plate in the ordinary 1781—1796 work represents a *Dianthus* sp. in the *Caryophyllaceae*. Through the kindness of Dr. Henri Humbert it has been ascertained that there was a "preparatory" edition of Jacquin's work sent to a select group of botanists and there is a copy of this preserved in the Bibliothèque Nationale de Paris "sous la cote 5.977". Plate 82 in this work is definitely our plant and the volume is dated 1781.

My reduction of the previously cited specimens of *C. broadwayi* and of *C. bahamense* in its entirety to the present variety may meet with criticism, but I see no way of adequately separating these taxa. It is even possible that the Trinidad material here regarded as var. *brittonii* may only represent a phase of the present variety, but experience with other groups in this family and in other groups seems to lend support to the belief that the Trinidad form is worthy of special recognition. Of *C. polystachyum* no authentic material has as yet been available to me for examination, but the original description leaves little doubt of its position here.

In all, 340 herbarium specimens, including the types of most of the names involved, and 10 mounted photographs and 2 sheets of clippings have been examined.

Citations: FLORIDA: Dade Co.: *Cabanis s.n.* (B); *Chrysler & Johnson 160* (Ru); *C. C. Deam 60931* (Dm); *Herb. Chapman s.n.* [South Florida] (C); *E. J. Palmer 27501* (Du—152327). Monroe Co.: *Blodgett s.n.* [Key West] (G, Ka, T); *Chapman 24* (W—57463); *Perrine s.n.* (T); *Rugel 59* (C, E—119119, E—119120, F—119035, M, W—512618), *s.n.* (W—512657); *Sargent s.n.* [Key West, Apl. 7, 1886] (A, A), *s.n.* [Key West, Apl. 13, 1886] (A), *s.n.* [Key West, Nov. 18, 1886] (A), *s.n.* [Key West, Nov. 19, 1886] (A, A); *Small & Mosier 5678* (N, S). BAHAMAS: *Brace 20* (N), *188* (K), *1882* (F—185309, N); *Britton & Brace 233* (B, B—photo, F—171690, G, K, K—photo, N, N—photo, S—photo, Z—photo); *Britton & Millspaugh 5744* (D—532232, F—198545, N, W—845017), *5744bis* (F—198546), *6142* (F—198881, N, N), *6142bis* (F—198882); *W. C. Coker 488* (N);

Collector undesignated s.n. (Bm); Dale s.n. [1730] (Bm); Degener 19051 (N); A. S. Hitchcock s.n. [Port Howe, XI.19.1890] (F—175145), s.n. [Nassau, XI.1890] (F—174800), s.n. [Nassau] (E—47501, F—228005), s.n. [Port Howe] (E—47500, F—228075); P. Wilson 7217 (F—221324, K, N), 7234 (F—221341, K, N). CUBA: Havana: C. F. Baker 5137, in part (B, Es, F—185735, N, Po—63507); Baker & Van Hermann 1958, in part (B, Po—63508); Ekman 297 (B, S); Moldenke & Moldenke 19895 (Es, Lg, N); Moldenke, Moldenke, León, & Acuña 15261 (Es); Sagra 7 (Dc), s.n. [Herb. Philad. 480] (B), s.n. [Herb. Philad. 481] (B), s.n. (Cb). Las Villas: Combs 468 (B, E—119094, F—17083, F—165115, F—358267, G, Io—1799, K, Ka—61425, N); R. A. Howard 4952 (N, N); Howard, Briggs, Kamb, Lane, & Ritland 374 (N); Roig 5743 (Es); Shafer 12196 (E—119079, N, W—699677). Oriente: N. L. Britton 1991 (N); Britton, Britton, & Cowell 12461 (B, F—325025, N, Ut, W—698455); Chrysogone 2703 (Ha); Clément 89 (Ha), 115 (Ha, N), 2857 (Ha, N), 2932 (Ha, N), 3092 (Ha, N), 5136 (N), 6569 (N); Crosby & Matthews 20 [9177] (Y, Y); Eggers 5344 (A, B, K, P, S, Vu, W—1323193); Ekman 380 (B, S, S), 3424 (S), 3576 (B, S), 7732 (N, S); Hioram s.n. [Abril 18, 1918] (Sc), s.n. [Guantanamo, Apr. 1918] (Se—14919); León 21279 (Ha, N); Victorin, Clément, & Alain 21564bis (Z). JAMAICA: Dancer s.n. (Cb); Herb. Fischer s.n. [1825] (L); Swartz s.n. (S, S). HISPANIOLA: Dominican Republic: Balbis s.n. [S. Domingo] (B); Bertero 607 (B), s.n. [S. D.] (E—119096); Eggers 2389b (B); Ehrenberg s.n. [Santo Domingo] (B, B); Ekman H.13025 (B, Ca—608042, Mi, S, W—1557853); Herb. Ventenat s.n. [St. Domingue] (Cb); Howard & Howard 8730 (S), 12068 (N); Mayerhoff 162 (B), s.n. [3.VIII.1856] (B), s.n. [1859] (B); Mus. Paris s.n. [1830] (B); Raunkiaer 862 (Cp), 878 (B, Cp), 1126 (Cp); L. C. Richard s.n. (P); Valeur 112 (A, Cb, Cb, E—984425, F—715069, N, S, W—1414587), 662 (A, Cb, Cb, Cp, E—1026250, F—721400, I, K, K, La, Mi, N, N, S, S). Haiti: Christ 1909 (B), 1911 (B), 1981 (B); Cook, Scofield, & Doyle 89 (W—794328); Désert 52n (Y); Ekman H.934 (B, S), H.1372 (B, S, S, W—1410128); Herb. Lamarck s.n. (P); Holdridge 1428 (N, N); E. C. Leonard 4991 (B, G, N, W—1077559); Leonard & Leonard 11819 (W—1450701); Nash 991 (F—185302, N); Picarda 531 (B); Poiteau s.n. [St. Domingue] (P); Poiteau & Turpin s.n. [St. Domingo] (L). PUERTO RICO: Britton, Britton, & Brown 5838 (N, N, W—1145321); Britton & Cowell 1382 (N, W—847183); Goll 695 (W—409238); Riédlé s.n. [Porto Rico] (P); F. L. Stevens 2387 (N); Underwood & Griggs 487 (N, W—405431). CULEBRAS: Britton & Wheeler 34 (F—201171, N, W—655817). VIRGIN ISLANDS: St. Croix: Herb. Univ. Christian. s.n. (Ol). St. John: Breutel s.n. [Emans] (Le); Britton & Shafer 249 (N, W—756261); Morrow 170 (W-

1411030); Warming 187 (Cp, W—1234904). St. Thomas: Baudin 216 [Herb. Jussieu 5089] (P); Bertero s.n. (Dc); Børgesen 44b (Us); Eggers 26, in part [Herb. Prager 20401/2261] (B, B, B, Br, Cb, Cb, Cb, Ew, Ew, Gg—31064, K, Le, Le, Mu—1412, P, Us, V—104673, Vu, W—1177972, X), 90, in part (Cp, F—141695, Mu—3729), 122 (G, L), s.n. (L); Ehrenberg 198 (B); Friedrichsthal 167 (V), 316 (V); Herb. Engler s.n. (B); Ledru 177 [Herb. Jussieu 5090] (P, P); Ravn s.n. (B); Read s.n. (D, D); L. C. Richard s.n. (P); Riédlé s.n. [St. Thomas] (P, P, P, P, P). Tortola: Britton & Shafer 914 (F—407902, K, N, W—756701); Fishlock 198 (A, G, K, N). Virgin Gorda: Fishlock 73 (N), 218 (G). LEEWARD ISLANDS: St. Bartholomew: Forsström s.n. [St. Bartholomew] (S, S, S, S, S, S, Us); Goës s.n. (B, S, S, Us); Haagum s.n. (S); Questel 287 (N). WINDWARD ISLANDS: Martinique: Herb. Ventenat s.n. (Cb, Cb). St. Vincent: Collector undesignated s.n. [1824] (G). WEST INDIES: Island undesignated: Bertero 290 (B); Boos s.n. (V); Forsström s.n. (S, S); Herb. Hohn. s.n. (Cp); Herb. Le Monnier s.n. (Cb); Herb. Reichenbach f. s.n. (V—160131); Moritz 75 (B); Mus. Bot. Berol. s.n. (B); Nuttall s.n. (D); L. C. Richard s.n. [ex India occidentali] (Cb); Swartz s.n. (S, S, S). CULTIVATED: Austria: Cult. Bot. Vindob. 867 (V); N. J. Jacquin s.n. [Hort. Vindob.] (B—photo of isotype, Bm—type, K—photo of isotype, N—photo of isotype, S—photo of isotype, V—isotype, Z—photo of isotype). California: Jack s.n. [Brandegee's garden, San Diego] (A); R. Moran 2773 (N). Denmark: Herb. Mus. Bot. Lund s.n. [h. Hafn.] (Lu), s. n. [cult. h. Hafn.] (Lu). France: Collector undesignated s.n. [Trianon] (Dc, Dc); Herb. Hort. Bot. Paris s.n. (Cb); Herb. Jard. de Paris s.n. [1828] (Dc); Ventenat s.n. [Hort. Paris] (Cp, V—285034). Germany: Herb. Kummer s.n. (Mu—1368, Mu—1372, Mu—1373, Mu—1608); Herb. Schwägrichen s.n. (Mu—1466); Hort. Bot. Berol. 32 (B); Otto s.n. [Hort. Bot. Berol., July 1838] (B). Italy: Herb. Harvey s.n. [h. R. P. 1843] (Du—166409), s.n. [H. R. P. 1844] (Du—166412). Missouri: Herb. Missouri Bot. Gard. s.n. [8/24/91] (E—119077), s.n. [9/26/95] (E—119078). LOCALITY OF COLLECTION UNDESIGNATED: Collector undesignated s.n. (Dc); Glaziou s.n. [mixed with no. 4929; Brazil?] (N); "Legit Anonymus ante annum 1840" s.n. (Ut). MOUNTED CLIPPINGS: O. E. Schulz in Urb., Symb. Ant. 6: 63. 1909 (B, B).

CITHAREXYLUM FULGIDUM Moldenke in Fedde, Repert. 37: 223—224. 1934.

Literature: Moldenke in Fedde, Repert. 37: 223—224. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Cit. 2: 347 & 419

(1948) and 3: 695, 900, & 901. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949; Moldenke, Phytologia 3: 375. 1950.

Shrub, to 3 m. tall; branchlets and twigs rather slender, acutely or obtusely tetragonal, glabrous, the young shoots blackening in drying; nodes annulate; principal internodes 2.2—4.1 cm. long; leaf-scars borne on ascending sterigmata 1—2 mm. in length; leaves decussate-opposite; petioles stout, 6—9 mm. long, revolute-margined and conspicuously canaliculate above, glabrous; leaf-blades rather thick-chartaceous or subcoriaceous, very dark-green on both surfaces, especially above, very nitid and lustrous on both surfaces, especially above, narrowly elliptic or oblong, 4.7—8.8 cm. long, 1.8—2.8 cm. wide, shortly and rather bluntly acuminate at the apex, entire, acute or cuneate into the margined petiole at the base, bearing a pair of inconspicuous elongate glands at the very base, perfectly glabrous on both surfaces; midrib slender, sharply prominulent above, prominent beneath; secondaries slender, 6—9 pairs, issuing at an angle of about 70° or 80° from the midrib, running almost straight toward the margins, arcuately anastomosing only at their termination and forming a conspicuous many-arched collective vein several mm. from the margins, prominulent on both surfaces; vein and veinlet reticulation sparse, prominulent on both surfaces; racemes terminal and terminating numerous short axillary twigs, erect or nutant, 7—9 cm. long, 1—1.3 cm. wide, many-flowered, unbranched; peduncles very slender, 1.5—2 cm. long, glabrous; rachis very slender, glabrous; pedicels filiform, 2—3 mm. long, glabrous; bracts none; bractlets few, linear, to 5 mm. long, or absent; prophylla linear, 1—2 mm. long; calyx obconic, about 2.6 mm. long and 1.8 mm. wide, minutely pulverulent, 5-costate, the rim very shortly 5-apiculate; corolla pale-violet, hypocrateriform, its tube about 3.3 mm. long, straight, about 0.7 mm. wide at the base and to 1.9 mm. wide at the apex, puberulent externally toward the apex, densely pilose within at the throat, the limb 5-parted, the lobes oblong-lingulate, about 1.3 mm. long and 1 mm. wide, rounded at the apex, pubescent within; stamens 4, didynamous, included, 2 inserted about 1.3 mm. and the other 2 about 1 mm. below the mouth of the corolla-tube; filaments about 0.5 mm. long; anthers oblong, about 0.7 mm. long and 0.4 mm. wide, dorsifixed; staminode obsolete; pistil included; style about 1.3 mm. long, glabrous; stigma very shortly 2-lobed, the lobes about 0.3 mm. long; ovary subglobose, about 0.7 mm. long and wide, glabrous; fruit red to black.

The type of this species was collected by Christian Julius Wilhelm Schiede (no. 83) near La Joya, San Luis Potosí, Mexico, on June 29th of a year before 1839, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species is said by the collector to be rare at the type locality. The type collection is referred to as "Schiede & Deppe 83" by Macbride on the labels of his photograph of an isotype. The species has been erroneously included in C. lucidum Schlecht. & Cham. and the type collection has even been considered to be a cotype of that species. It has also been confused in herbaria with *C. caudatum* L. It has been collected along roadsides in pine woods at an altitude of 2000 meters, fruiting in October. In all, 12 herbarium specimens, including the type, and 10 mounted photographs have been examined.

Citations: MEXICO: Hidalgo: *H. E. Moore 5308* (N). San Luis Potosí: *Schiede 83* [Macbride photos 34317] (B--photo of type, E--119053--isotype, F--976255--photo of isotype, F--976400--isotype, K--photo of type, Kr--photo of isotype, L--isotype, L--isotype, L--isotype, N--type, N--photo of type, N--photo of isotype, N--photo of isotype, P--isotype, S--photo of type, V--285035--isotype, Z--photo of type, Z--photo of isotype); *Schiede & Deppe s. n.* [La Joya] (Bm, Cb). Veracruz: *Schiede 2128*, in part (S).

CITHAREXYLUM GLABRUM (S. Wats.) Greenm., Proc. Amer. Acad. 32: 300--301. 1897.

Synonymy: *Gonzalea glabra* S. Wats., Proc. Amer. Acad. 25: 152. 1890.

Literature: S. Wats., Proc. Amer. Acad. 25: 152. 1890; Greenm., Proc. Amer. Acad. 32: 300--301. 1897; Durand & Jacks., Ind. Kew. Suppl. 1: 187. 1902; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 43. 1904; Junell, Symb. Bot. Upsal. 4: 46--47, pl. 2, fig. 2. 1934; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Alph. List Invalid Names 58. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Cit. 1: 162, 301, & 306. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 10. 1947; Moldenke, Alph. List Cit. 2: 437, 499, & 543 (1948), 3: 829 & 831 (1949), and 4: 1020 & 1057. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949.

Illustrations: Junell, Symb. Bot. Upsal. 3: pl. 2, fig. 2. 1934.

Shrub or tree, to 7 m. tall; branchlets and twigs medium or slender, subterete, many-ribbed, straw-colored or brown, glabrous, not blackening in drying; nodes annulate; principal internodes 4-6.2 cm. long; leaf-scars borne on very short and usually not conspicuous sterigmata about 1 mm. in length; petioles slender, 1.3-2 cm. long, glabrous, the upper 1/3 margined with two, very narrow, erect, wing-like continuations of the leaf-margins, forming a shallow trough, these wing-like margins becoming confluent at about 2/3 the length of the petiole so that the lower 2/3 of the petiole is neither winged nor canaliculate; leaf-blades chartaceous, rather dark- or light-green above, lighter beneath, dull or subnitid, narrowly oblong or oblong-lanceolate, 3.5--11 cm. long, 1.1--3 cm. wide, sharply (or rarely bluntly) acute or acuminate at the apex, entire, subacute at the base and abruptly prolonged into the petiole, bearing 1 or 2 pairs of small brownish glands on this prolongation, perfectly glabrous on both surfaces; midrib slender, plane above, prominent beneath; secondaries very slender, 9--11 pairs, close together, issuing at an angle of about 45° or 50° from the midrib, arcuate, plainly or obscurely anastomosing along the very margins, not prominulent above; vein and veinlet reticulation abundant, delicate, plainly visible on both surfaces although not prominulent on either surface; racemes numerous, axillary and terminal, mostly axillary, erect or nutant, often compound with 1—3 pairs of branches almost as long as the central raceme which is 5.5—13 cm. long and 1—1.5 cm. wide, densely many-flowered; peduncles slender, 0.7—3.3 cm. long, glabrous, often with 1, 2, or 3 nodes, each bearing a pair of caducous bracts; rachis slender, glabrous; pedicels filiform, to 1 mm. long and jointed just below the flowers, or obsolete; bracts subfoliaceous, narrowly lanceolate or linear, often falcate, to 2.5 cm. long and 0.5 cm. wide, stipitate, glabrous; bractlets linear or absent; prophylla setaceous, less than 1 mm. long; flowers fragrant; calyx about 2 mm. long, 5-nerved, somewhat 5-angled, the rim subtruncate and ciliate; corolla white or creamy-white to pinkish, tubular, about 5 mm. long, the tube broad, glabrous externally below, puberulent above, pubescent in the throat, the lobes oblong or rounded, broad, pubescent on both surfaces; style glabrous; fruiting-calyx and fruit not known.

The type of this species was collected by Cyrus Guernsey Pringle (no. 2442) in the mountains near Lake Chapala, Jalisco, Mexico, on December 16, 1889, and is deposited in the United States National Herbarium at Washington. It is described by the collector as a tree 20 feet tall, and has been found also along rivers and at altitudes to 1400 meters, blooming in November and December.

It has in the past been confused in herbaria with C. donnell-smithii Greenm. It is closely related to C. fulgidum Moldenke, but the latter differs in the following respects: (1) its tetragonal branchlets and twigs, (2)its young shoots, peduncles, and entire inflorescence, including the rachis, pedicels, calyx, and corolla nigrescent in drying, whereas in C. glabrum all these parts are very light-gray and stramineous when dry, (3) its lack of axillary racemes and its sparser and always unbranched inflorescences, (4) its shorter petioles which are stouter and are winged and canaliculate all the way to the base, (5) its much more lustrous and more regularly bluntly short-acuminate leaf-blades, (6) its midrib, secondaries, and veinlets being prominulent above, especially the midrib, which is very sharply so, (7) its secondaries issuing at greater angles with the midrib, being straighter, and forming a very conspicuous many-arched collective vein several mm. within the margins, (8) its sparse veinlet reticulation, (9) its much longer pedicels, and (10) its smaller flowers.

In all, 26 herbarium specimens, including the type, and 7 mounted photographs have been examined.

Citations: MEXICO: Guerrero: Hinton 14825 (Au, N). Jalisco: Diquet s.n. [Jalisco] (F—185310, N); Pringle 2442 (B—isotype, B—photo of type, Bm—isotype, C—isotype, Ca—104985—isotype, Ca—139567—isotype, D—isotype, F—105006—isotype, G—isotype, K—isotype, K—photo of type, Me—isotype, Mu—3991—isotype, N—isotype, N—photo of type, S—isotype, S—photo of type, Us—

isotype, Vt—isotype, W—49886—type, W—1323198—isotype, Z—photo of type), 5240 (B, Ed, Le, Me, N—photo, Z—photo), s.n. [Col. Maderas Expos. Chicago 51] (Me).

CITHAREXYLUM GLAZIOVII Moldenke in Fedde, Repert. 37: 224—225. 1934.

Literature: Glaz., Bull. Soc. Bot. France Mém. 3: 546. 1911; Moldenke in Fedde, Repert. 37: 224—225. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 25. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 36 & 88. 1942; Moldenke, Alph. List Cit. 1: 237. 1946; Moldenke, Phytologia 2: 385 & 387. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 61. 1948; Moldenke, Alph. List Cit. 2: 337 (1948), 3: 694 (1949), and 4: 1046. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76, 157, & 179. 1949; Moldenke, Phytologia 3: 286. 1950.

Large or small tree or shrub; branches subterete, gray, glabrous; branchlets obtusely or acutely tetragonal, very light-gray, sparsely furfuraceous-puberulent or glabrate; young shoots very slender, tetragonal, light-brown in drying, densely puberulent or very short-pubescent; nodes rather inconspicuously annulate; principal internodes 1—3.5 cm. long; leaf-scars subsessile on young shoots, borne on more or less prominent sterigmata on older wood; leaves decussate-opposite or rarely subopposite on young shoots; petioles slender, 8—13 mm. long, obscurely sulcate above, densely brownish-puberulent; leaf-blades chartaceous, dark-green on both surfaces, dull, varying from oblong or elliptic to subobovate (or the stunted leaves sometimes ovate), 5.6—14.5 cm. long, 2.1—6.5 cm. wide, acute or very shortly sharp-acuminate at the apex, entire, acute or subcuneate at the base, bearing a pair of obscure plangs close to the midrib at the very base, densely and uniformly short-puberulent-punctate above, becoming glabrous, densely puberulent or very short-pubescent with light-brown hairs beneath; midrib slender, sharply prominulent above, prominent beneath; secondaries very slender, 4—7 pairs, ascending, often only the uppermost ones arcuate, the lower almost straight, usually sharply prominulent on both surfaces; vein and veinlet reticulation fine, abundant, more or less prominulent, especially above, mostly obscured by the pubescence beneath; racemes terminal and terminating abbreviated axillary twigs, simple, nutant, 8.5—17 cm. long, to 2 cm. wide, rather loosely many-flowered; peduncles slender, mostly abbreviated to about 1.5 cm., densely short-pubescent like the twigs; rachis slender, densely short-pubescent; pedicels obsolete or less than 1 mm. long; bracts occasional and leaf-like; bractlets linear-spatulate, to 8 mm. long and 2.5 mm. wide, often found all through the inflorescence, often absent; prophylla linear, 1—3 mm. long, short-pubescent; flowers fragrant; calyx tubular, slightly zygomorphic, about 4.1 mm. long and 2.3 mm. wide, puberulent, its rim irregularly bilabiate, one sinus about 0.5 mm. and the other about 1.3 mm. deep, one lip 2-apiculate, the other lip 3-apiculate; corolla hypocrateriform, white, its tube cylindric, straight, about 7.8 mm. long, about 1 mm. wide at the base, ampliate to about 1.9 mm. at the apex, externally glabrous, densely pilose in the throat within, the limb 5-parted, the lobes unequal, spatulate-lingulate, about 3.3 mm. long, about 1.4 mm. wide near the apex, rounded at the apex; stamens 4, distinctly didynamous, included, 2 inserted about 2.6 mm. and the other 2 about 4.1 mm. below the mouth of the corolla-tube; filaments of the upper stamens about 1 mm. long, of the lower ones about 1.5 mm. long; anthers oblong, about 1.8 mm. long and 0.5 mm. wide; pistil included; style about 1.4 mm. long, glabrous; stigma not ampliate, very shortly 2-lobed, the lobes about 0.5 mm. long; ovary ovate, about 1 mm. long and wide, glabrous; fruiting-calyx shallowly cupuliform, greatly indurated, to 6 mm. long and 11 mm. wide, glabrous, not at all ribbed nor striate, its rim deeply 5-lobed with broadly triangular and often irregular lobes; fruit large, oblong, about 16 mm. long and 11 mm. wide, glabrous, apparently not very fleshy, splitting at the apex, subnitid.

The type of this species was collected by Auguste François Marie Glaziou (no. 13058) — in whose honor it is named — in woods between Rio Sitio and Barbacena, Minas Gerais, Brazil, on January 22, 1880, and is deposited in the herbarium of the Universitetets Botaniske Museum at Copenhagen. Apparently the flowers are shed very easily in this species, as one may see from the fact that in many specimens the long racemes have flowers only at their very tips, while the pedicels and prophylla which carried or subtended many more flowers remain beneath them on the rachis.

The species has been confused in the past with C. myrianthum Cham., which, indeed, it closely resembles, and is so cited by Glaziou in the work listed above. The Glaziou 9989, which he cites, is actually true C. myrianthum. The species has also been confused by herbarium workers with C. quadrangulare Jacq. [=C. spinosum L.]. It is worth noting that Glaziou 11328, cited by him as C. quadrangulare, has conspicuously heavier calyxes and corollas and the flowers have all remained attached to the very base of the rachis. Glaziou 13059 represents fruiting material. Some of its original printed labels read "Rio de Janeiro", but the longhand inscription on the label in the Paris herbarium plainly states "Minas", and Glazious, in his published report on his collections, cites this number from Minas Gerais and says that it blossoms in January and February. The labels on some specimens of the type collection have been inscribed "13085" through what was undoubtedly an error in transcription. The record of this species from Rio de Janeiro, as given by me in my earlier publications, was based on a plant cultivated there and is, therefore, not a valid record.

The irregularly split or even labiate calyx of this species during anthesis is noteworthy. The plant is apparently closely related to C. laetum Hiern and to C. krukovii Moldenke. In all, 23 herbarium specimens, including the type, and 8 mounted photographs have been examined.

Citations: BRAZIL: Ceará: Ducke 2115 (N). Minas Gerais: Glaziou 13058 [Macbride photos 28394] (B--isotype, B--photo of type, Br--isotype, Cb--isotype, Cb--isotype, Cp--type, F--830275--photo of isotype, G--isotype, K--isotype, K--isotype, K--photo of type, Kr--photo of isotype, L--isotype, N--isotype, N--photo of isotype, N--photo of type, P--isotype, P--isotype, S--photo of type, W--1110398--isotype, Z--photo of type), 13059 (B, Bz--18718, Cb, Cb, K, L, P, P). CULTIVATED: Brazil: Glaziou 11328 (Cp, K, P).

CITHAREXYLUM GLEASONIANUM Moldenke in Fedde, Repert. 37: 225--226. 1934.

Literature: Moldenke in Fedde, Repert. 37: 225--226. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 13 & 36. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16, 71, & 88. 1942; Moldenke, Alph. List Cit. 1: 314 (1946) and 2: 422, 435, 500, 562, & 607. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 61. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29, 157, & 179. 1949; Moldenke, Alph. List Cit. 3: 834 & 835 (1949) and 4: 1028. 1949.

Shrub, to 5 m. tall; trunk 4--5 cm. in diameter; bark incanous; branches and branchlets slender, acutely and sharply tetragonal, light- or dark-gray, twiggy, the young shoots brownish and very minutely puberulent-strigillose, older wood glabrate; pith slender; nodes annulate; principal internodes 7--33 mm. long, usually much abbreviated; leaf-scars borne on short but comparatively stout and prominent sterigmata which are often quite conspicuous; leaves decussate-opposite, numerous on the young shoots only; petioles slender, often more or less purplish, 4--13 mm. long, glabrous or subglabrate, somewhat canaliculate above; leaf-blades chartaceous, bright-green above, much lighter beneath, not discoloring in drying, dull, ovate-elliptic or oblong-elliptic, 3.2--7.3 cm. long, 1.6--3.2 cm. wide, acute or short-acuminate at the apex, entire or sometimes rather irregularly repand-undulate along the margins, rounded at the base but very shortly prolonged into the petiole, bearing 1 or 2 obscure brown glandular disks on the prolongation or not glanduliferous, glabrous on both surfaces or very minutely and sparsely puberulous-strigillose when immature, densely punctate beneath; midrib very slender, plane above, prominulent beneath; secondaries very slender, 5--7 pairs, arcuate-ascending, plane above, prominulent beneath, not anastomosing or very faintly so; vein and veinlet reticulation abundant, very fine, usually almost indiscernible above, not at all prominulent beneath; racemes terminal and terminating short axillary twigs, simple, erect or nutant, abbreviated, 4--7 cm. long, 1.3--1.8 cm. wide, many-flowered; peduncles slender, abbreviated, about 1 cm. long, glabrate, usually with one node bearing a pair of bractlets; rachis slender, glabrate; pedicels slender, about 1 mm. long, glabrate, elongate to 3 mm. in fruit; bracts none; bractlets linear, to 3 mm. long; prophylla setaceous, about 1 mm. long; calyx obconic, about 2.8 mm. long and 1.8 mm. wide, plainly 5-costate, minutely puberulent, its rim very shortly 5-dentate; corolla hypocrateriform, the tube about 3.6 mm. long, straight, about 0.7 mm. wide at the base, ampliate to 2 mm. at the apex, externally glabrate, densely pilose in the throat within, the limb 5-parted, the lobes subequal, ovate, about 1 mm. long and 0.7 mm. wide, rounded or subacute at the apex; fertile stamens 4, didynamous, included, 2 inserted about 1 mm. and the other 2 about 1.3 mm. below the mouth of the corolla-tube; filaments about 0.7 mm. long; anthers ovate or sagittate, about 0.7 mm. long and 0.5 mm. wide; staminode filiform, about 0.5 mm. long; pistil included; style about 1 mm. long, glabrous; stigma very shortly bilobed, the lobes about 0.5 mm. long; ovary pyriform, about 1.3 mm. long, about 1 mm. wide at the apex, glabrous, apparently 2-celled; fruiting-calyx shallowly campanulate, light and herbaceous, becoming more indurated in age, 2—3 mm. long, about 5 mm. wide, very minutely puberulous or glabrate, its rim subtruncate or obscurely 5-angulate-dentate; fruit blue-black, subglobose or oblong, about 6 mm. long and 5 mm. wide, fleshy, nitid, glabrous, 2-lobed.

The type of this species was collected by Carl Albert Purpus (*no. 5829*) at Boca del Monte, Puebla, Mexico, in May of 1912, and is deposited in the herbarium of the Missouri Botanical Garden at St. Louis. It is named in honor of Henry Allan Gleason, who first pointed out to me its distinctness from *C. affine* D. Don, with which it had hitherto been confused by collectors and herbarium workers.

The leaf-blades, on being pressed in botanical driers, often take on a more or less falcate shape toward the apex with the 2 halves pressing asymmetrically both at apex and at the base. It has been collected in anthesis in May and July, and in fruit in January. Sharp found it growing at an altitude of 7800 feet.

In all, 20 herbarium specimens, including the type, and 7 mounted photographs have been examined. The specimen from Darmstadt, Germany, cited below, was grown from seed sent by C. A. Purpus in 1904 from Ixtaccihuatl, Puebla, Mexico.

Citations: MEXICO: Puebla: *Purpus 5829* (B—photo of type, Bm—isotype, Ca—164178—isotype, E—704913—type, F—386443—isotype, G—isotype, K—photo of type, N—isotype, N—photo of type, S—photo of type, W—464455—isotype, Z—photo of type), *s.n.* [9 Juli '24] (A). Vera Cruz: *Kerber 258* (B, B, Bm, Br, Cp, K, L, Mu—1737, N—photo, Us, X, Z—photo); *A. J. Sharp 44668* (N). CULTIVATED: Germany: *Herb. Bot. Gard. Darmstadt s.n.* [1927] (A).

CITHAREXYLUM HERRERAE Mansf., Notizbl. Bot. Gart. Berlin 9: 469. 1925.

Synonymy: *Citharexylon herrerae* Mansf. ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941.

Literature: Mansf., Notizbl. Bot. Gart. Berlin 9: 469. 1925; Hill, Ind. Kew. Suppl. 7: 50. 1929; Herrera, Revist. Chil. Hist. Nat. 34: 25—30, pl. 2. 1930; Herrera, Estud. Fl. Cuzco 160—161. 1930; Moldenke, Alph. List Common Names 15. 1939; Moldenke, Geogr. Distrib. Avicenn. 23. 1939; Herrera, Sinop. Fl. Cuzco 1: 353. 1941; Moldenke, Suppl. List Invalid Names 2. 1941; Worsdell, Ind. Lond. Suppl. 1: 233. 1941; Moldenke, Known Geogr. Distrib.

Verbenac., [ed. 1], 34 & 88. 1942; Moldenke, Alph. List Invalid Names 13. 1942; Moldenke, Phytologia 2: 96. 1944; Bol. Mus. Hist. Nat. Javier Prado 9: 166. 1945; Moldenke, Alph. List Cit. 1: 122, 230, 319, & 321 (1946) and 2: 328, 339, 349, 423, & 431. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 44 & 64. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 71 & 179. 1949; Moldenke, Alph. List Cit. 3: 690, 807, 872, & 951 (1949) and 4: 1035, 1037, & 1060. 1949; Moldenke, Phytologia 4: 69. 1952.

Illustrations: Herrera, Estud. Fl. Cuzco 160--161. 1930; Herrera, Revist. Chil. Hist. Nat. 34: 27--28, pl. 2. 1930.

Shrub or tree, to 5 m. tall; branches and branchlets stout, medullose, acutely tetragonal, conspicuously decussately 4-margined or 4-winged, the wings always lying in one plane (as the margins are whenever they occur in this genus), remaining green for some years, light or eventually brown in drying, glabrous, shiny; twigs slender, numerous, acutely tetragonal and 4-margined like the branches, green when fresh, light-brown in drying, medullose, glabrous, shiny, the uppermost ones modified into spike-like thorns which become increasingly larger as the branchlet grows, eventually producing 1 to several nodes and internodes and bearing leaves and axillary racemes and secondary thorns at the nodes although still spike-like at the apex, in such cases secondary-axillary branchlets usually also armed but not terminating in a spike-like thorn arise between the former and the leaf-sterigmata; nodes annulate; principal internodes 1.5--5.5 cm. long; leaf-scars borne on rather large, ascending, corky sterigmata which are to 3 mm. long; leaves decussate-opposite, numerous; petioles slender, 1--3 mm. long, glabrous, flat above; leaf-blades chartaceous, dark-green above, lighter beneath, narrowly oblong or lanceolate, 1--2.5 cm. long, 3--9 mm. wide, varying from rounded to subemarginate or acute at the apex, entire or sharply serrate to below the middle or almost to the base, acute or subcuneate at the base, glabrous on both surfaces, densely glandular-impressed-punctate beneath, apparently not glanduliferous at the base; midrib and the 4--6 pairs of secondaries very slender, plane above, slightly prominulent beneath, not conspicuous; vein and veinlet reticulation obscure; racemes axillary, abundant, abbreviated, 1--2.5 cm. long, about 1 cm. wide, few- or submany-flowered, mostly borne in pairs at each upper node; peduncles slender, to 7 mm. long, glabrate; rachis slender, glabrate; pedicels obsolete during anthesis or to 1 mm. long, incrassate and to 2 mm. long in fruit; bracts and bractlets absent; prophylla setaceous, minute; calyx about 3.5 mm. long, glabrous, its rim shortly 5-dentate; corolla greenish-yellow, hypocrateriform, about 5 mm. long, pilose in the throat, the limb 5-parted, the lobes about 1 mm. long, externally scattered-pilose, plainly pilose within; stamens 4, inserted at about the middle of the corolla-tube, included; filaments about 1 mm. long; anthers about 1.5 mm. long, the thecae slightly divergent at the base; style about 2 mm. long, included; stigma subbilobed; fruiting-calyx subpatelliform, indurated, to 6 mm. wide, glabrous, more or less 5-ribbed, subentire or irregularly 5-lobed; fruit large, oblong or globose, to 11 mm. long, 8—9.5 mm. wide, fleshy, much wrinkled and 2-lobed in drying, very shiny, red when fresh, composed of 2 pyrenes, each pyrene 2-locular.

The type of this distinctive species was collected by Fortunate Luciano Herrera y Garmendia (*no. 677*) — in whose honor it is named -- in the mountains of Saxaihuamán, province of Cercado, in the district of San Sebastián, at an altitude of 3200—3400 meters, Cuzco, Peru, in May of 1925, and is deposited in the herbarium of the Botanisches Museum at Berlin. The species has been found at altitudes of 2900 to 4000 meters, inhabiting rocky slopes of canyons. Its margined branches, branchlets, and twigs, which apparently remain green for a number of years, together with its spike-like thorns and small glabrous leaves and racemes render its identification easy. It has been collected in anthesis in January, February, April, and May, and in fruit in April, May, and from July to September. The common name "huairuru" is recorded for it by Herrera, who also says "Sus ramas fructíferas de un hermoso color rojo se emplean en la ornamentación de los nacimientos. Cultivable como planta de adorno." In all, 29 herbarium specimens, including the type, and 11 mounted photographs and clippings have been examined.

Citations: PERU: Apurimac: *Vargas 8753* (N), *9137* (N). Cuzco: *Cook & Gilbert 1888* (E—794722, E—photo, W—703621); *Ferreyra 9856* (Z); *C. Gay s.n.* [Cuzco] (F—998841, G, P, P); *Herrera 677* [Macbride photos 17595] (B--type, B—isotype, B—isotype, B—isotype, F—663024--photo of 2 isotypes, K—photo of type, Kr—photo of 2 isotypes, N—isotype, N—photo of type, N—photo of 2 isotypes, S—photo of type, Z--photo of type), *1464a* (F—589538, N, N--photo, W—1283241, Z—photo), *2705* (B), *s.n.* (W—clippings & photos); *F. W. Pennell 13606* (D—636132, F—557993, G, N, W—1340626); *Rose & Rose 19031* (N, W—761622); *Soukup 322* (F—853771). Department undetermined: *C. Gay 1939* (P); *Pearce s.n.* (K).

CITHAREXYLUM HEXANGULARE Greenm., Field Columb. Mus. Publ. Bot. 2: 187--188. 1907.

Synonymy: *Citharexylum affine* Mart. & Gal., Bull. Acad. Roy. Brux. 11 (2): 328. 1844 [not *C. affine* D. Don, 1831]. *Citharexylum reticulatum* Donn. Sm. apud Greenm., Field Columb. Mus. Publ. Bot. 2: 188, in syn. 1907 [not *C. reticulatum* H.B.K., 1817, nor Cham., 1909]. *Citharexylon affine* Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 15, in syn. 1940. *Citharexylum fastigiatum* Standl. & L. Wms., in herb.

Literature: Mart. & Gal., Bull. Acad. Roy. Brux. 11 (2): 328. 1844; Jacks., Ind. Kew. 1: 549. 1893; Donn. Sm., Enum. Pl. Guatem. 6: 34. 1903; Greenm., Field Columb. Mus. Publ. Bot. 2: 187-188. 1907; Prain, Ind. Kew. Suppl. 3: 43. 1908; Moldenke, Alph. List Common Names 7 & 24. 1939; Moldenke, Geogr. Distrib. Avicenn. 13, 15—17, & 36. 1939; Moldenke, Prelim. Alph. List Invalid Names 15 & 16. 1940; Moldenke, Carnegie Inst. Wash. Publ. 522: 190--191. 1940; Lundell, Contrib. Univ. Mich. Herb. 8: 61. 1942; Moldenke, Alph. List Invalid Names 13 & 14. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16, 19--22, 71, & 88. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 135, 178, 218, 252, 314, & 320 (1946), 2: 331, 332, 334, 343, 350, 419, 422, 437, 500, 503, 566, 587, 588, 601, & 604 (1948), 3: 677--679, 709, 714, 715, 725, 802, 877, 892, 902, & 948 (1949), and 4: 1013, 1026, 1028, 1045, 1057, 1061, 1077, 1095, 1119, 1131, & 1247. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29, 35--39, 157, & 179. 1949.

Shrub or small tree, to 12 m. tall; trunk to 15 cm. in diameter; branches medium or slender, acutely or obtusely tetragonal, gray, glabrate; branchlets and twigs slender, acutely and sharply tetragonal, very minutely puberulous, becoming glabrous, brown, often decidedly ribbed; nodes annulate; principal internodes 1--4.5 cm. long; leaf-scars borne on prominent ascending sterigmata to 5 mm. long; leaves decussate-opposite (or approximate on young shoots), occasionally ternate; petioles very slender, 0.6--1.9 cm. long, minutely puberulous or glabrate, deeply canaliculate above; leaf-blades chartaceous, uniformly green or gray-green on both surfaces, dull, lanceolate or lanceolate-oblong to elliptic, 4--16.2 cm. long, 1.1--5.5 cm. wide, bluntly acute or acuminate at the apex, entire, acute or acuminate at the base and prolonged into the petiole, usually bearing a pair of large elongated glands on the prolongation beneath, very minutely and obscurely puberulous on both surfaces, becoming glabrate; midrib very slender, sharply prominulent above, prominent beneath; secondaries very slender, 6--8 pairs, ascending, hardly at all arcuate, prominulent on both surfaces; vein and veinlet reticulation very abundant, fine, prominulent above, this prominulence of the venation imparting to the upper leaf-surface a decided roughness; racemes axillary or terminating short twigs, simple or compound, with 2--10 opposite or whorled branches, erect, densely many-flowered, the main raceme 10--31 cm. long and to 1 cm. wide, the lateral ones 4.5--12 cm. long; peduncles slender, 1.5--5.5 cm. long, brown, minutely puberulous, occasionally with 1 or 2 nodes, acutely tetragonal; rachis very slender, brown, minutely puberulous; pedicels filiform, about 1 mm. long, puberulous; bracts absent; bractlets linear or subulate, minute or to 14 mm. long, equaling or slightly exceeding the pedicels, persistent; prophylla linear, 1--2 mm. long; flowers fragrant; calyx tubular-campanulate, about 3.5 mm. long, 5-toothed, 5-nerved and with intermediate smaller subanastomosing veins, glabrate except for the ciliolate rim; corolla white, tubular-campanulate, 5--6 mm. long, pubescent on both surfaces, its tube slightly surpassing the calyx, the lobes somewhat unequal, ovate-rotund to broadly oblong, 2--3 mm. long, nearly or quite as broad, spreading or reflexed; perfect stamens 4, the fifth reduced to a mere staminode, included; style pubescent; ovary glabrous; fruiting-calyx cupuliform, about 4 mm. long and wide, striate-ribbed, glabrous od subglabrate, its rim shallowly and often irregularly dentate or erose; immature fruit oblong, to 6 mm. long and 4 mm. wide, glabrous, yellow when fresh, turning red or reddish-brown and finally black when mature, 2-lobed, apiculate when immature.

The type of this distinctive species was collected by Hans von Türckheim (no. 7765 — his original field number was II.192) at Cubilqüitz, at an altitude of 350 meters, Alta Verapaz, Guatemala, in November of 1900 (not September, 1901, as stated on the labels) and is deposited in the Gray Herbarium of Harvard University. The type of C. affine Mart. & Gal. was collected by Henri Guillaume Galeotti (no. 7097) in the woods of Antigua, near Vera Cruz, Mexico.

The usually grayish-green and uniform color of the leaves and their roughened consistency on the upper surface due to the prominulence of the entire venation, the acutely tetragonal branchlets, twigs, and peduncles, and the usually compound racemes distinguish this species well. The branchlets, twigs, and young shoots are often decidedly ribbed. The Türckheim II.192 at Stockholm is dated "September, 1904", but may actually still be a part of the type collection and therefore an isotype.

The species is said to inhabit riversides, banks, and flooded plains, dunes, low second growth, limestone rocks, open mountain forests, and low banks, at altitudes from 50 to 665 meters. It has been collected in anthesis from June to December and in April. The E. P. Johnson 80 collection is inscribed "Yucatán & Tabasco", so may actually have come from either state. The collector states that the species grows by rivers, is a bush or tree resembling a willow (Salix) in growth, and "blooms when very small; mostly grows as a shrub". It is described by Lundell as a treelet 5—12 meters tall, while Williams says it is an "herb 1 foot 6 inches tall, among logs above stream, not common". Schipp, on the other hand, found it to be "very common on riverbank in open places."

Lundell & Lundell 7679 is rather anomalous in having especially short leaf-blades, decidedly lanceolate in shape, but similar leaves are often seen on typical branches. The collection is described as having been taken from a shrub only 3—5 feet tall in low second growth. Typical specimens have very much longer and more oblong-lanceolate or even elliptic leaf-blades. The Rovirosa 248 and 248bis specimens at Kew, at the Philadelphia Academy of Science, and in the Columbia University herbarium are most remarkable in consisting of two large leafy shoots and 4 racemiferous shoots. The leaves are regularly ternate on all except one of the leafy shoots, and on these ternate-leaved shoots the stems are 5-angled and 5-margined instead of only 4-angled and 4-margined as on the opposite-leaved shoot and as is normal for the species. The racemiferous shoots have their racemes all simple, axillary, and uniformly ternate. The collections were made on the flooded plains of the Río San Sebastian in Tabasco, Mexico, on August 13, 1888.

The species is cultivated at Brisbane in Queensland. Mell reports the vernacular name "cajjalaco", and notes "so named because a bird of the same name is said to be fond of the bright red berries" [the plant, of course, does not produce berries; the fruits are drupes]. Other common names are "canahuite", "palomillo", and "pálomillo". It has been confused in the past with C. affine D. Don, C. quadrangulare Jacq. [=C. spinosum L.], C. reticulatum H.B.K., and Clerodendrum sp. The Cufodontis collection at Vienna bears printed labels reading "Cufodonti". In all, 103 herbarium specimens, including the types of all the names involved, and 5 mounted photographs have been examined.

Citations: MEXICO: Campeche: Matuda 3861 (F—1027199, Mh, N). Chiapas: Juzepczuk 1369 (G), 1869 (F—689271, L). Jalisco: Karwinski 707 (L). Oaxaca: Martínez-Calderón 88 (W—1809139); L. C. Smith 632 (G). Quintana Róo: Lundell & Lundell 7679 (Mi, Mi, N). San Luis Potosí: Vines 3307 (F—1024917), 3330 (W—1483172). Tabasco: E. P. Johnson 80 (C, K); Matuda 3562 (Du—299381, F—1026377, Mh, N); Rovirosa 248 (C, D, K), 248bis (D). Vera Cruz: Galeotti 7097 (Br, Cb, P), s.n. (K); Hahn s.n. [Juin '66] (P); Karwinski 708 (L); Liebmann 11362 (Cp, F—689260); Mell s.n. [Cazones] (N); Purpus 5922 (B, Bm, Ca—166346, E—705066, E—705175, Ed, F—386498, G, G, L, L, N, N, P, S, W—464508, W—464510); Ll. Williams 8636 (F—897041, N). State undetermined: Karwinski s.n. [1841, 1842] (L). GUATEMALA: Alta Verapaz: H. V. Johnson 527 (F—707766, La, W—1081420); Türckheim 7765 [II.192; Hort. Thenensis I.4196] (A—isotype, B—isotype, B—photo of type, Br—isotype, C—isotype, E—119052—isotype, Ed—isotype, F—575757—isotype, G—type, K—isotype, K—photo of type, Mu—3972—isotype, N—photo of type, S—isotype, S—photo of type, W—398330—isotype, W—1323208—isotype, W—1323209—isotype, W—1323210—isotype, Z—photo of type). BRITISH HONDURAS: C. L. Lundell 6969 (Au, F—894324, I, Mi, Mi, N), 7022 (Mi); Peck 567 (B, G); Sampson 14 (K, K); Schipp 1190 (Bm, Ca—519163, Cb, E—1048249, F—683597, K, Mi, N, N, S). HONDURAS: Cortés: J. B. Edwards P.660 (A, B, Ca—522676, F—688143, S, W—1588595). NICARAGUA: Cabo Gracias á Dios: Schramm 35 (W—1406449). Segovia: Schramm s.n. [200 miles up the Wanks River] (F—717697). COSTA RICA: Limón: Shank & Molina R. 4263 (W—2085188). Puntarenas: Cufodontis 176 (V). CULTIVATED: Queensland: C. T. White 2457 (A).

CITHAREXYLUM HIDALGENSE Moldenke, Geogr. Distrib. Avicenn. 13, nom. nud. (1939), Phytologia 1: 414—415. 1940.

Literature: Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Phytologia 1: 414—415. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Cit. 1: 183, 272, & 306. 1946; Salisb., Ind. Kew. Suppl. 10: 53. 1947; Moldenke, Alph. List Cit. 2: 419, 437, 447, 459, & 499 (1948), 3: 679, 763, 830, 891, & 900 (1949), and 4: 1028 & 1049. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949.

Shrub or small tree, to 7 m. tall; branches and branchlets medium, gray, obtusely tetragonal, short-hirsute or furfuraceous at the apex, soon becoming glabrescent, lenticellate; twigs slender, nigrescent in drying, sparsely short-hirsute; nodes obscurely annulate; principal internodes 1—3.5 cm. long; leaves decussate-opposite; leaf-scars large, borne on extremely large and massive, divergent-ascending, corky sterigmata to 5 mm. long; petioles slender, 1.5—3.3 cm. long, more or less hirsute; leaf-blades membranous, brunneous or nigrescent above in drying, lighter beneath, oblong-elliptic or elliptic to subobovate, 5.2—11 cm. long, 2—7.7 cm. wide, acute or short-acuminate at the apex, asymmetrically angulate near the apex or entire, acute or subacuminate and often more or less asymmetric at the base, usually bearing 1 or 2 black glands at the very base, shortly hirsute-pubescent above, becoming merely densely puberulent in age, densely hirsute (especially along the larger venation) beneath; midrib slender, not prominent on either surface; secondaries very slender, 5—8 pairs, arcuate-ascending, not prominent on either surface, conspicuous beneath only because of their more or less distichous pubescence; vein and veinlet reticulation obscure or indiscernible; racemes axillary or terminal, nutant, 8—16 cm. long, about 2 cm. wide during anthesis, simple, many-flowered; peduncles and rachis slender, more or less hirsute-pubescent, brown, the former 5—7 mm. long; pedicels filiform, about 2.5 mm. long, short-pubescent; bracts and bractlets none; prophylla linear-setaceous, about 1 mm. long; corolla white or lavender; fruiting-calyx light, cupuliform, about 4 mm. long and 8 mm. wide, 5-ribbed, minutely puberulent or glabrescent, its rim shallowly 5-angulate or subentire; fruit oblong, red or red-black, about 10 mm. long and 7 mm. wide, fleshy, glabrous, nitid. wrinkled and nigrescent in drying.

The type of this species was collected by Cyrus Guernsey Pringle (no. 8969) in barrancas below the Trinidad Iron Works, at an altitude of 5000 feet, in Hidalgo, Mexico, on April 22, 1904, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is obviously very closely related to C. sessaei D. Don, with which it has been confused in herbaria. Specimens have also been misidentified in herbaria as C. ovatifolium Greenm. and C. solanaceum Cham. Its hirsute-velutinous pubescence and nigrescent leaves are quite characteristic. The finest specimens are preserved in the herbarium of the Botanisches Museum at Berlin. Collector have found it by cornfields, on mountainsides in wet Liquidambar forests, on limestone ledges, and in streamside thickets, from 1665 to 2000 meters altitude, blooming in April and October, and in fruit in June and November. The Ehrenberg collection cited below may not actually have come from Vera Cruz, as its label merely states "Minas". In all, 50 herbarium specimens, including the type, and 2 mounted photographs have been examined.

Citations: MEXICO: Hidalgo: Coulter 1173 (K, K); H. E. Moore 2631 (N); Pringle 8969 (A—isotype, B—isotype, Bm—isotype, Ca—139932—isotype, Cb—isotype, Cm—isotype, Cp—isotype, D—522688

—isotype, E—119064—isotype, Ed—isotype, Ed—isotype, F—178638—isotype, G—isotype, Gg—31075—isotype, Gg—155407—isotype, It—isotype, K—isotype, L—isotype, Le—isotype, Me—isotype, Me—isotype, Me—isotype, N—type, N—photo of isotype, Na-26035—isotype, Ol—isotype, P—isotype, S—isotype, V—4738—isotype, Vt—isotype, W—461445—isotype, X—isotype, X—isotype, Z—photo of isotype). Michoacán: Hinton 15606 (N). Puebla: C. L. Lundell 12642 (Ld); F. Salazar s.n. [Zacapoaxtla] (Me, W—1169844). Vera Cruz: Ehrenberg s.n. [Minas] (B, B, B); Liebmann 11190 (Cp), 15487 (Cp), 15488 (Cp). Zacatecas: Schiede 570 (B, B, B, B).

CITHAREXYLUM HINTONI Moldenke in Fedde, Repert. 37: 226—227. 1934.

Literature: Moldenke in Fedde, Repert. 37: 226—227. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Alph. List Common Names 8. 1939; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Phytologia 2: 96. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 64. 1948; Moldenke, Alph. List Cit. 2: 341, 540, & 541. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949.

Weak leaning shrub or vine, 3—4 m. tall; branches and branchlets very stout, decidedly tetragonal, extremely sharply 4-angled or even 4-margined, chestnut-brown, densely pubescent; nodes pronouncedly annulate; leaves decussate-opposite; petioles stoutish, 0.7—3.7 cm. long, densely brown-pubescent; sterigmata often large and ascending-prominent; leaf-blades firmly chartaceous, ovate, 5.5—12.5 cm. long, 4—8 cm. wide, acute at the apex, entire, acuminate at the base, lightly pubescent above, densely velutinous-pubescent beneath; midrib stout, very prominent beneath; secondaries slender, about 9 pairs, ascending, practically straight, arcuate-anastomosing toward the margins; racemes axillary and terminal, usually terminating short axillary twigs, erect or nutant, 5—28 cm. long, 1—2 cm. wide, many-flowered; peduncles and rachis densely grayish-pubescent; pedicels slender, very short during anthesis, elongated to 1.5 mm. in fruit, densely pubescent; calyx tubular, light, about 3.9 mm. long and 2 mm. wide, slightly contracted above the ovary, minutely puberulous, not conspicuously 5-costate, the rim very shortly 5-dentate; corolla infundibular, the tube cylindric, about 5.9 mm. long, glabrate externally, densely pilose within, the limb 5-parted, the lobes hyaline, obovate, about 2.6 mm. long and wide, rounded and somewhat irregularly crisped at the apex; fertile stamens 4, didynamous, included, 2 inserted about 2.6 mm. and the other 2 about 1.8 mm. below the mouth of the corolla-tube; filaments about 1 mm. long, more or less flattened; anthers ovate, about 0.9 mm. long and 0.7 mm. wide; staminode inserted about 3 mm. below the mouth of the corolla-tube, about 0.5 mm. long; pistil included; style rather thick, about 2.3 mm. long, glabrous; stigma very shortly bilobed, the lobes more or less fimbriate; ovary oblong-obovate, about 1 mm. long and wide, glabrous, distinctly 5-lobed, indistinctly 4-celled; fruiting-calyx light, campanulate, spreading, about 4 mm. long and 5 mm. wide, short-pubescent, its rim subtruncate; fruit oblong, about 7 mm. long and 4 mm. wide, black, glabrous.

The type of this species was collected by George B. Hinton (no. 3399) — in whose honor it is named — by the river at Bejucos, at an altitude of 610 meters, in the district of Temascaltepec, state of México, Mexico, on February 16, 1933, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. Hinton 3209, which is a fruiting specimen, collected on January 26 of the same year, is inaccurately called the type collection by Miranda.

The species has been found by collectors along the sides of rivers, in oak woods, in low sandy matorral, on the sides of arroyos, in wet places, and in high mixed woods, at altitudes of 700 to 2500 meters, blooming from February through April, in fruit in January, April, and May. A vernacular name recorded for it is "chichalaco". Birds are said to be fond of the fruit. It is closely related to C. ovalifolium Greenm. The dried flowers are remarkable for their persistent violet color, a color which is often exhibited also by the upper 1/3 of the calyx. In all, 24 herbarium specimens, including the type, and 10 mounted photographs have been examined.

Citations: MEXICO: México: T. Coulter 1173 (Ch); Hinton 3209 (E--photo, K, Me, N--photo, S--photo, W--photo, Z--photo), 3399 (E--photo of type, K--type, N--isotype, N--photo of type, S--photo of type, W--photo of type, Z--photo of type), 7514 (Au, F--875865, K, Me, N, N), 7534 (F--875875, K, N, N, N), 7661 (F--875848, K, N, N); Matuda & al. 30356 (Ss), 30536 (Ss), 30671 (Z), 30890 (Ss).

CITHAREXYLUM HIRTELLUM Standl., Field Mus. Publ. Bot. 4: 257. 1929.

Literature: Standl., Field Mus. Publ. Bot. 4: 257 (1929) and 10: 335. 1931; Hill, Ind. Kew. Suppl. 8: 53. 1933; Moldenke, Alph. List Common Names 26. 1939; Moldenke, Geogr. Distrib. Avicenn. 15 & 16. 1939; Moldenke, Carnegie Inst. Wash. Publ. 522: 191—192. 1940; Moldenke in Woodson & Schery, Ann. Mo. Bot. Gard. 28: 464. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 20, 21, 23, & 88. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 231, 232, & 320. 1946; Moldenke, Phytologia 2: 331. 1947; Moldenke, Alph. List Cit. 2: 331, 460, 603, & 614 (1948), 3: 677, 960, & 974 (1949), and 4: 1061, 1066, & 1141. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 35—37, 40, & 179. 1949.

Shrub or tree, to 7 m. tall; stems 4—5 cm. in diameter; branches and branchlets medium or slender, acutely tetragonal, finely hirtellous with brown hairs; twigs very slender, brown, finely or densely hirtellous; nodes annulate; principal internodes 2--5.8 cm. long; leaf-scars borne on ascending sterigmata which on older wood become quite stout and corky and to 3 mm. long; leaves decussate-opposite; petioles slender or stoutish, 5-7 mm. long, densely hirtellous, canaliculate above; leaf-blades firmly chartaceous, rich-green above, somewhat lighter or pale gray-green beneath, subnitid or shiny (especially above), elliptic or subrotund, 5—9 cm. long, 1.1—6 cm. wide, acute or acuminate at the apex, entire, cuneate or subacuminate at the base, with a pair of elongate glands at the very base, finely hirtellous above when immature, becoming subglabrate, persistently densely hirtellous beneath; midrib very slender, plane or more or less prominulent above, prominent beneath; secondaries very slender, 4—6 pairs, ascending, more or less arcuate, inconspicuously anastomosing, varying from obscure to prominulent above, prominulent beneath; vein and veinlet reticulation varying from obscure to prominulent on both surfaces; racemes axillary and terminal, erect, simple, 6—14 cm. long, to 1.5 cm. wide, many-flowered; peduncles slender, 1—5 cm. long, densely hirtellous like the twigs; rachis slender, densely hirtellous; pedicels filiform, to 1 mm. long, hirtellous; bracts usually absent; bractlets linear, to 7 mm. long, puberulent; prophylla linear-subulate, 1—2 mm. long; flowers sweet-scented; calyx cylindric-campanulate, green, 4.5—5 mm. long, subacute at the base, sparsely hirtellous, its rim remotely denticulate; corolla white, about 7 mm. long, its tube scarcely longer than the calyx, glabrous, the lobes rounded, spreading, sparsely and minutely puberulent; fruiting-calyx broadly campanulate, heavy, pale-green, 6—7 mm. long and wide, glabrous, its rim 5-lobed, the lobes broad and rounded; fruit elliptic, dull orange-green when immature, later orange or red, 8—10 mm. long, about 6 mm. wide, fleshy.

The type of this species was collected by John Sidney Karling (*no. 9*) in the vicinity of Tower Hill, British Honduras, in *1928*, and is deposited in the herbarium of the Chicago Natural History Museum. The species has been found in acacual, pasture lands, and on high ridges, at altitudes of 50 to 1500 meters, in flower in February, May, June, and December, and in fruit in July, August, and December. Standley describes it as a shrub only 3 feet tall. Gentle says that the "berries" [actually drupes] are red, and Steyermark describes the leaves as "firmly membranous". It was confused with *C. caudatum* L. by Standley. It is obviously closely related to *C. hexangulare* Greenm., which differs in its mostly glabrous or subglabrate branches, branchlets, twigs, and leaves, in its larger leaves, and in its larger, more abundant, and often compound racemes. The *Steyermark 41818* collection cited below does not appear to be typical. In all, 46 herbarium specimens, including the type, and 5 mounted photographs have been examined.

Citations: GUATEMALA: Izabal: *Steyermark 41816* (N), *41818* (Ld, N), *41825* (N). BRITISH HONDURAS: *Gentle 106* (F—696360), *238* (Au, Mi, N, S), *435* (F—702163, I, K, La, Mi, N, S), *1177* (A, E—1075886, F—733459, G, I, K, Mi, N, N), *4922* (N), *s.n.* [C. L. Lundell 4922] (A, Ba, D—722661, E—1043726, F—683521, I, La, Mi, N, S); *Karling 9* (B—photo of type, F—579931—type, K—isotype, K--photo of type, N—photo of type, S—photo of type, W—1490851—isotype, Z—photo of type); *Kinloch 2* (F—580344, Y). HONDURAS: Atlántida: *P. C. Standley 55697* (A, F—581347, N, W—1408897). PANAMA: Chiriquí: *Woodson & Schery 755* (N).

xCITHAREXYLUM HYBRIDUM Moldenke, Geogr. Distrib. Avicenn. 12, nom. nud. (Sept. 20, 1939); Lilloa 4: 313. October 11, 1939.

Literature: Moldenke, Geogr. Distrib. Avicenn. 12. 1939; Moldenke, Lilloa 4: 313. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 29, 30, & 88 (1942) and [ed. 2], 56, 57, & 179. 1949; Moldenke in Cheesman, Fl. Trin. & Tob. 2 (6): 22—23. 1955.

This appears to be a natural hybrid between *C. fruticosum* L. and *C. spinosum* L., found where the ranges of the two species overlap. Its characters are more or less intermediate between those of the typical forms of the two parents. The typical forms of both parents are found abundantly in the Lesser Antilles and they do not seem to hybridize so freely there, but most of the glabrous Trinidad and Tobago material, as well as most of that from northern continental South America, seems to be more or less intermediate.

The type of the hybrid was collected by Walter Elias Broadway (*no. 4064*, in part) at Rockley Vale, Tobago, on July 21, 1910, and is deposited in the Britton Herbarium at the New York Botanical Garden. Some sheets of this number greatly resemble *C. spinosum*, while others, because of their short pedicels and other characters, seem closer to *C. fruticosum*. Other collections which appear to represent the hybrid are *Broadway 955* and *6658*, *Eggers 5484*, *Sandwith 1821*, and *Smith & Smith 405*. The *Rehder 894*, cited by me under *C. fruticosum*, greatly resembles the present hybrid, but was collected in Florida, where *C. spinosum* does not occur. *Otero 681*, from Puerto Rico, herein cited as *C. spinosum*, may also be this hybrid.

Sandwith reports that his collection was made on a coral cliff and that the plant was a shrub or small tree, with white flowers and pale-brownish-red fruit, flowering and fruiting in October. *Broadway 6658* has long-stalked flowers and has in the past been regarded as more or less anomalous material of *C. spinosum*. The Edinburgh specimen of *Smith & Smith 405* has dentate leaves. In all, 32 herbarium specimens, including the type, have been examined.

Citations: WINDWARD ISLANDS: Grenada: *W. E. Broadway 955* (B, B, L). St. Vincent: *Smith & Smith 405* (B, Ed, G). TOBAGO: *W. E. Broadway 4064* (B—isotype, Bm—isotype, Cb—isotype, Cb—isotype, Cb—isotype, Cb—isotype, Cp—isotype, F—376642—isotype, G—isotype, Gg—204757—isotype, N--type, S—isotype, Ut—isotype), *6658* (Bm, E—972129, F—689807, I, K, Ms, Ms, W—1343499).

CITHAREXYLUM ILICIFOLIUM H.B.K., Nov. & Sp. Pl. 2: 256. 1817.

Synonymy: *Citharexylon ilicifolium* Humb. & Bonpl. ex Steud., Nom. Bot., ed. 1, 202. 1821. *Citharexylon ilicifolium* H.B.K. apud Spreng. in L., Syst. Veg., ed. 16, 2: 76. 1825. *Duranta ilicifolia* Willd. ex Walp., Repert. 4: 74, in syn. 1845. *Citharexylon ilicifolium* Hook., in herb. *Cytharexylum ilicifolium* H.B.K., in herb.

Literature: H.B.K., Nov. Gen. & Sp. Pl. 2: 256. 1817; Steud., Nom. Bot., ed. 1, 202. 1821; Spreng. in L., Syst. Veg., ed. 16, 2: 764. 1825; Walp., Repert. 4: 74. 1845; Schau. in A. DC., Prodr. 11: 609. 1847; Agardh, Theor. Syst. Pl. pl. 22. 1858; Jacks., Ind. Kew. 1: 549. 1893; Rusby, Bull. Torrey Bot. Club 27: 81. 1900; L. H. Bailey, Man. Cult. Pl., pr. 1, 631 & 807 (1924) and pr. 2, 631 & 807. 1925; Stapf, Ind. Lond. 2: 220. 1930; Junell, Symb. Bot. Upsal. 4: 46--47 & 49, figs. 87 & 88. 1934; Dahlgren, Svensk. Bot. Tidsk. 32: 231. 1938; L. H. Bailey, Man. Cult. Pl., pr. 3, 631 & 807. 1938; Moldenke, Geogr. Distrib. Avicenn. 22, 23, 28, & 36. 1939; Moldenke, Prelim. List Invalid Names 25. 1940; L. H. Bailey, Man. Cult. Pl., pr. 4, 631 & 807. 1941; Moldenke, Alph. List Invalid Names 23. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 33, 34, 40, 71, & 88. 1942; L. H. Bailey, Man. Cult. Pl., pr. 5, 631 & 807. 1944; L. H. & E. Z. Bailey, Hortus 151. 1945; Moldenke, Alph. List Cit. 1: 10, 13, 28, 37, 50, 56, 128, 163, 202, 230, & 273 (1946) and 2: 328, 331, 347, 433, 447, 448, 556, 561, 562, 565, 573, 580, 603, & 642. 1948; Van Rensselaer, Trees Santa Barbara, rev. ed., 163. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 44. 1948; Moldenke, Alph. List Cit. 3: 667, 690, 758, 802, 805, 857, 903, 956, & 957 (1949) and 4: 979, 983, 1016, 1060, 1062, 1066, 1069, 1075, 1098, 1104, & 1253. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 69, 71, 96, 157, & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Espinosa, Est. Bot. Sur Ecuad. 2: 6. 1949; Moldenke, Journ. Calif. Hort. Soc. 15: 85. 1954; Moldenke, Mem. N. Y. Bot. Gard. 9: 176. 1955.

Illustrations: Agardh, Theor. Syst. Pl. pl. 22. 1858; Junell, Symb. Bot. Upsal. 4: figs. 87 & 88. 1934.

Large or slender straggling shrub or small tree, to 7 m. tall, with several stems from the base, few- or many-branched; trunk to 5 cm. in diameter at breast height; branches and branchlets rather slender, stiff, often twiggy, more or less acutely tetragonal, gray, minutely puberulous or glabrate; twigs slender, usually tetragonal, light-brown, hirtellous; nodes obscurely annulate; principal internodes abbreviated, 5—12 mm. long; leaf-scars borne on large, stout, ascending, corky sterigmata which are often as long as the diameter of the twig or may be shorter or longer; leaves numerous, decussate-opposite; petioles slender, often flattened, 2--5 mm. long, hirtellous or puberulent to glabrate; leaf-blades firmly chartaceous or subcoriaceous, uniformly bright-green on both surfaces when dry, rich-green with transparent veins or dark-green and somewhat lustrous above and lighter beneath when fresh, not discoloring in drying, shiny even when dry, oblong or elliptic, 1.8—7.2 cm. long, 0.8—4 cm.

wide, acute at the apex, entire or sharply serrate with rather few or many noticeably apiculate teeth, acute at the base, usually cuneately prolonged into the petiole, not glanduliferous at the base, glabrous on both surfaces, glandular-punctate (but not impressed-punctate) beneath, not punctate above; midrib very slender, mostly plane above, prominent beneath; secondaries numerous, short, 7—10 pairs, not very arcuate, prominulent on both surfaces; vein and veinlet reticulation fine, abundant, prominulent on both surfaces; racemes axillary or terminating very short axillary twigs, abbreviated, erect or nutant, simple, 1—4.5 cm. long, rather few-flowered; peduncles very slender, 5—10 mm. long, hirtellous or puberulent, often with 1 or 2 bractlet-bearing nodes; rachis very slender, hirtellous; pedicels filiform, to 1 mm. long, hardly elongate in fruit, hirtellous; bracts none; bractlets linear, 1—3 mm. long; prophylla setaceous, about 1 mm. long; flowers very fragrant; calyx subcampanulate, 5-striate, pentagonal, externally pubescent, its rim very shortly 5-dentate; corolla varying from white or whitish to dirty yellow or pale apricot-yellow, its tube subcylindric, slightly longer than the calyx, pilose in the throat, the limb 5-parted, about 6 mm. wide, spreading, the lobes equal, rounded at the apex, pilose within; stamens 4 or 5, equal, inserted at the top of the corolla-tube, slightly exserted; filaments very short; anthers sagittate, erect, 2-celled, longitudinally dehiscent; pollen gray; style half as long as the corolla-tube, glabrous; stigma capitate; ovary subglobose, glabrous; fruiting-calyx cupuliform, about 3 mm. long and 6 mm. wide, puberulent or hirtellous, its rim conspicuously 5-lobed, each lobe often subserrate or at least apiculate at the apex, spreading; fruit subglobose, dark cherry-red or eventually black or black-purple, about 6 mm. long and wide, fleshy, glabrous, 2-lobed, enclosed at the base by the persistent fruiting-calyx, composed of 2 pyrenes, which are 2-celled, each cell 1-seeded; seeds oblong.

The species was based by Kunth on several collections made by Friedrich Heinrich Alexander von Humboldt and Aimé Jacques Alexandre Bonpland, or by Bonpland alone, near Quito, Chillo, Riobamba, and Penipe, at altitudes of 7800—9000 feet, in Ecuador [or Chile, according to Walpers, undoubtedly in error]. Its immature leaf-blades are membranous, but the mature ones are always very firm and stiff or even subcoriaceous. The very immature ones blacken in drying, but the mature ones usually do not. Seedlings (vid. specimen in the Arnold Arboretum herbarium, collected by Judd) have leaves much like those of Rhacoma ilicifolia (Poir.) Trelease. Mature leaves vary from entire to sharply serrate, often on the same twig. Frequently mature ones have much the texture and appearance of those of Ilex opaca Ait. It is said to be a very abundant shrub about the village of Azogues in the Andes of Ecuador, where it has been collected frequently by botanists and where it is employed for making fences. A drawing by Jameson in the Kew herbarium indicates the fuit as 2-locular, each locule containing 2 erect seeds. This drawing also shows an abnormal flower with 2 styles, one of which has a bifid stigma.

The species is also very common about Quito, Oña, and Cuenca, in Ecuador.

The leaves are mostly small, 1.8—4.2 cm. long and 8—25 mm. wide; larger ones are exceptional (vid. Spruce 5008 at Kew). Spruce says "some trees have entire, others toothed leaves, but I see no other difference". Espinosa says that it is a shrub with numerous stiff branches, forming a part of the matorral, often in association with Duranta triacantha A. L. Juss. and species of Baccharis and Passiflora. It has been found by collectors in woods at high altitudes, in the interandine highlands, along the borders of trails and roads, in the chaparro and in hedgerows, at lakesides, in loam soil on the lower slopes of mountains that have been mostly cleared, in pastures cut by deep ravines, and on dry flats alongside of rivers and on bearby low bluffs, at altitudes of 2460 to 3665 meters, blooming from November to January, March, April, and June to August, and in fruit in February, June to August, November, and December. Common names are "casanta", "sharcau", and "zitac". The gynoecium morphology is discussed by Junell in the reference cited above, and phases of the cytology are discussed by Dahlgren.

The species has been confused by herbarium workers with C. reticulatum H.B.K., Ilex scopulorum Humb. & Bonpl., and Jacquinia sp. Balls states that the flowers are "in loose blunt spikes 1 1/2 inches long, very sweet-scented; leaves small, white below" and that the plants are "loose straggling shrubs and very small trees, to 10 feet tall, growing on dry banks in sandy soil and on edges of woods, etc." His herbarium material, however, does not show the leaves as white below. Penland & Summers erroneously refer to the fruit as "berries". Van Rensselaer reports the tree cultivated at Santa Barbara, California, and Reynolds, Schroeder, & McClintock at West Los Angeles. The Lehman 6592 collection cited below may actually have come from Cañar, since its label merely states "between Cuenca and Azogues". The labels on the Macbride photograph, cited below, are misleading; they are inscribed "Chile", while the photograph of the label on the actual specimen indicates that the collection was made at "Quito". My own notes indicate that the collection was made at Chillo, which is probably the basis for the "Chile" on the longhand labels. In all, 127 herbarium specimens, including the types of all the names involved, and 14 mounted photographs have been examined.

Citations: ECUADOR: Azuay: Camp E.422 (N), E.1793 (N), E.1873 (N), E.2030 (N); Giler 6 (W--2106671); Harling 690 (S); Jameson s.n. [Oña] (K); Lehmann 6592 (B, F—578237, K, N); Penland & Summers 1069 (N). Cañar: Fosberg & Giler 22662 (N, N); Jameson s.n. [Azogues] (G); Prieto P.165 (N). Chimborazo: Asplund 5945 (S); Bonpland 3195 (N--photo of cotype, P—cotype, P—cotype, Z —photo of cotype), s.n. [Río Chambo] (E—photo of cotype, N--photo of cotype, P—cotype, S--photo of cotype, W—photo of cotype, Z—photo of cotype); Rimbach 142 (F—684698, N, N, Y—

23892), 515 (S); Spruce s.n. [Puenta de Quinia] (K). Pichincha: André 3702 (F--533748, K, N), K.1551 (K, V); Balls 5787 (W--1777706); Benoist 2378 (P, P), 3796 (P), s.n. (P); Bonpland s.n. [Quito] (F--976535--cotype, P--cotype, P--cotype); Couthouy s.n. [1855] (D--611788, G, Os, T); Espinosa 2433 (N); Fagerlind & Wibom 2000b (S); Firmin 258 (A, F--615621, W--1420222), 290 (F--615753, W--1344984); Hall 82 (K); Herb. Bernhardi s.n. [Quito] (B); Herb. Humboldt s.n. [Chillo; Macbride photos 17593] (F--663022--photo of cotype, Kr--photo of cotype, N--photo of cotype); Holmgren 951 (S); Humboldt & Bonpland s.n. [Quito] (B--cotype, B--cotype, K--photo of cotype, N--photo of cotype, S--photo of cotype, Z--photo of cotype); Jameson 178 (K, La), 314 (Bm, Cb, Ed, K, K, P), s.n. [environs of Quito & Cuenca] (V--166963); Karsten s.n. [Quito] (L, V, V--124269); Little 6105 [Herb. U. S. Dept. Agr. Forest Serv. 96742] (It, N); Moldenke & Moldenke 19787 (F, Fy, Mg, Mr, N, No, Ot, S, Ss); Mutis 1645 [160] (W--1561462); Sodiro 257 (B, B); Spruce 5225 (Bm, Cb, K, K, N, V--166930, V--285036, X); H. Sydow 21 (Mh); M. Wagner s.n. (Mu--1115); Weydahl 227 (S). Tunguragua: Spruce 5008 (Bm, Cb, Ed, K, K, L, V--166934, V--285039, X). Province undetermined: Rimbach 228 [Interandine highlands] (W--1484629), 282 [Interandine highlands] (F--766432, N). PERU: Department undetermined: Dombey 252 (P), s.n. (P); C. Gay 1339 (P), s.n. [1839--1840] (P). BOLIVIA: La Paz: Pearce s.n. [Pelechuco] (K). CULTIVATED: California: W. Bradbury s.n. [Santa Barbara] (Ba); Eastwood s.n. [Montecito, Nov. 8, 1923] (Gg--31069), s.n. [Montecito, April 1926] (Gg--140721); Reynolds, Schroeder, & McClintock 186 (La); Walther 374 (A, N), s.n. [Montecito, Sept. 1919] (Gg--31070), s.n. [Santa Barbara, Oct. 1923] (Gg--31068). Ecuador: Ewan 16413 (W--2106153). England: Herb. Hort. Kew s.n. [July 1861] (K, K); Herb. Mus. Bot. Lund s.n. [Hort. Kew 1854] (Lu). Germany: Herb. Hort. Bot. Berol. s.n. [1899] (B); Schlechter s.n. [Hort. Bot. Dahlem] (B); Strauss s.n. [Hort. Dahlem, 3.8.1909] (B), s.n. [Hort. Dahlem, 9.6.1910] (B).

CITHAREXYLUM INTEGERRIMUM (Kuntze) Moldenke, Phytologia 1: 17. 1933.

Synonymy: Citharexylon villosum var. integerrimum Kuntze, Rev. Gen. Pl. 2: 504. 1891. Citharexylum villosum var. integerrimum Kuntze apud Standl., Field Mus. Publ. Bot. 18: 1000-1001. 1938.

Literature: Kuntze, Rev. Gen. Pl. 2: 504. 1891; Moldenke, Phytologia 1: 17. 1933; Standl., Field Mus. Publ. Bot. 18:1000-1001. 1938; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 17. 1939; Moldenke, Prelim. Alph. List Invalid Names 16. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed.

1], 22 & 88. 1942; Moldenke, Alph. List Invalid Names 13 & 58. 1942; Moldenke, Alph. List Cit. 1: 58. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 5. 1947; Moldenke, Alph. List Cit. 2: 340 & 625. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 39 & 179. 1949.

Shrub or tree, to 3 m. tall; branches, branchlets, and twigs slender, acutely tetragonal, light-brown, minutely puberulent, becoming glabrate in age; nodes annulate; principal internodes 1.7—4 cm. long; leaf-scars borne on very short sterigmata, not conspicuous; leaves decussate-opposite; petioles slender, 3—8 mm. long, subglabrate; leaf-blades chartaceous, dark-green above, lighter beneath, dull, oblong or elliptic to ovate, 4.7—7.5 cm. long, 1.9—3 cm. wide, bluntly acute or short-acuminate at the apex, entire, sbruptly contracted and subcuneate-decurrent into the petiole at the acute base, obscurely and minutely puberulous above and rather densely hirtellous with light-brownish or stramineous hairs beneath, or eventually glabrous; midrib slender, plane or subprominulent above, prominent beneath; secondaries very slender, distant, 4—6 pairs, arcuate-ascending, not at all anastomosing, more or less prominulous on both surfaces; vein and veinlet reticulation abundant, more or less prominulous, especially above; racemes terminating the axillary twigs, paniculate, erect, 2--15 cm. long, slender, about 1 cm. wide, rather loosely many-flowered, simple; peduncles slender, 1.4—1.8 cm. long, rather densely puberulent; rachis slender, rather densely puberulent or minutely pilose; pedicels slender or filiform, 0.9—1.5 mm. long; bracts and bractlets absent; prophylla minute, linear-setaceous, obscure; calyx narrowly campanulate, about 2.5 mm. long, sparsely puberulent, the rim conspicuously dentate; corolla twice as long as the calyx, its lobes sparsely puberulent on the outside; fruiting-calyx and fruit not known.

The type of this species was collected by Carl Ernst Otto Kuntze (*no. 2016*) at an altitude of 100 feet in Costa Rica, in June, 1874, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is very closely related to *C. hexangulare* Greenm. and *C. hirtellum* Standl. It has been collected in anthesis in May and June. The Brenes collection cited below was misidentified as *C. viride* Moldenke. In all, 2 herbarium specimens, including the type, and 5 mounted photographs have been examined.

Citations: COSTA RICA: Guanacaste: *Brenes 15532* (F—857918). Province undetermined: *Kuntze 2016* (B—photo of type, K—photo of type, N—type, N—photo of type, S—photo of type, Z—photo of type).

xCITHAREXYLUM JAMAICENSE Moldenke, hybr. nov.

Planta hybrida naturalis signis foliorum florumque *C. caudatum* L. et *C. fruticosum* L. intermediis.

A natural hybrid between *C. caudatum* and *C. fruticosum*, with foliar and inflorescence characters intermediate between those of the two parents.

The type of the hybrid was collected by Janet Russell Perkins (*no. 419*) on the island of Jamaica, and is deposited in the herbarium of the Botanisches Museum at Berlin. It is known thus far only from the type specimen.

Citations: JAMAICA: *J. R. Perkins 419* (B—type).

CITHAREXYLUM JÖRGENSENII (Lillo) Moldenke, Geogr. Distrib. Avicenn. 29, nom. nud. (1939); Revist. Sudam. Bot. 6: 178. 1940.

Synonymy: *Duranta jörgensenii* Lillo, Act. Prim. Reun. Nac. Soc. Argent. Cienc. Nat. 1916, 224. 1919. *Duranta joergensenii* Lillo apud Hill, Ind. Kew. Suppl. 7: 80. 1929. *Citharexylum xenicum* Moldenke, Lilloa 6: 317, in syn. 1941. *Citharexylum joergensenii* (Lillo) Moldenke apud Salisb., Ind. Kew. Suppl. 11: 55. 1953.

Literature: Lillo, Act. Prim. Reun. Nac. Soc. Argent. Cienc. Nat. 1916, 224. 1919; Hill, Ind. Kew. Suppl. 7: 80. 1929; Latzina, Trab. Inst. Bot. y Farm. 54: 78. 1935; Latzina, Lilloa 1: 188. 1937; Moldenke, Geogr. Distrib. Avicenn. 29. 1939; Moldenke, Revist. Sudam. Bot. 6: 178. 1940; Moldenke, Prelim. Alph. List Invalid Names 18 & 25. 1940; Moldenke, Lilloa 6: 317 (1941) and 8: 414. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 88. 1942; Moldenke, Alph. List Invalid Names 15 & 23. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 66. 1948; Moldenke, Alph. List Cit. 2: 347, 377, 598, & 599 (1948) and 3: 695, 746, & 912. 1949; Moldenke, Phytologia 3: 135. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 103 & 179. 1949; Salisb., Ind. Kew. Suppl. 11: 55. 1953.

Shrub or small tree, to 10 m. tall; wood white; branches and branchlets acutely tetragonal, decussately submargined, gray, glabrous; nodes annulate; principal internodes 2—3 cm. long; young twigs very slender, dark-chestnut, very short, glabrous; leaf-scars on the branches and branchlets heavy, very prominent, corky, 2—4 mm. long and wide, diverging at an angle of 85°—90°; leaves decussate-opposite, crowded on the young twigs; petioles very slender, 7—15 mm. long, submargined, glabrous; leaf-blades chartaceous, elliptic, 3.5—5.5 cm. long, 1.7—2.8 cm. wide, rounded or obtuse to subacute at the apex, distinctly serrate along the margins with about 4 teeth per cm., entire and cuneate at the base and attenuate into the petiole, glabrous above, glabrous but densely punctate beneath; midrib subimpressed above in drying, prominulous beneath; secondaries about 7 per side, somewhat indistinct above, prominulous and arcuate-ascending beneath, indistinctly anastomosing near the margins; vein and veinlet reticulation obscure above, slender and abundant beneath; racemes terminating abbreviated twigs, nutant, 2—3.3 cm. long, 5—8-flowered, in fruit about 1.4 cm. wide; calyx campanulate; corolla yellow to yellowish or pale-yellowish, about 1/3 longer than the calyx; fruiting pedicels 2—3 mm. long, glabrous, often reflexed; fruiting-calyx cupuliform, membranaceous, 2.5—3 mm. long, about 5 mm. wide, glabrous, obscurely 5-costate, spreading, the rim irregularly lobed or split or even several-parted; fruit green or rose, oblong, about 5 mm. long and 4 mm. wide, glabrous, wrinkled and 2-sulcate in drying, 2-seeded.

The type of this species was collected by Pedro Jörgensen (no. 47) — in whose honor it is named — in a subtropical woods at Estancia Las Pavas, Puesto, El Saladillo, dept. Chichigasta, Tucumán, Argentina, in December, 1916. The type of C. xenicum was collected by August Schuel (no. 197) at Laguna del Feson, Esquina Grande, dept. Chichigasta, Jujuy, Argentina, in 1913, and is deposited in the herbarium of the Naturhistorisches Museum at Vienna. The dried leaves are somewhat darker green above than beneath. It has been confused in herbaria with Duranta serratifolia (Griseb.) Kuntze, which has a tubular calyx and a blue corolla 4 times as long as the calyx. It has been collected in anthesis and fruit in December, and has been found at altitudes of 2100 meters. The name which must be adopted for this species is unfortunately very similar to that of C. jurgenseni Briq., named in honor of Jurgensen, a Mexican collector. Under the present edition of the International Rules of Nomenclature, however, the two names are different and distinct, differing by several important letters, and are both valid. In all, 8 herbarium specimens, including the types of all the names involved, and 9 mounted photographs have been examined.

Citations: ARGENTINA: Catamarca: Jörgensen 1735 [Herb. Osten 11011] (N, N, Ug). Jujuy: Schuel 197 [Macbride photos 34315] (F—976253—photo, Kr—photo, N, N—photo, N—photo, V, Z—photo). Tucumán: Jörgensen 35 (N), 47 [Herb. Osten 11480] (F—photo of isotype, N—photo of isotype, Sg—photo of isotype, Ug—isotype, Z—photo of isotype); Monetti 2189 [Herb. Inst. Miguel Lillo 32488] (Au).

CITHAREXYLUM JURGENSENI Briq., Bull. Herb. Boiss. 4: 342. 1896.

Synonymy: Citharexylum longipes Rose ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940.

Literature: Briq., Bull. Herb. Boiss. 4: 342. 1896; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 43. 1904; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Prelim. Alph. List Invalid Names 16. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Invalid Names 14. 1942; Moldenke, Alph. List Cit. 1: 218 & 240 (1946) and 2: 334, 336, & 601. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 66. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949; Moldenke, Alph. List Cit. 3: 692, 788, & 873 (1949) and 4: 1024, 1025, 1031, & 1032. 1949.

Tree, to 6 m. tall; branches and branchlets rather stout, more or less acutely tetragonal and margined, brownish, medullose, glabrous; twigs more slender, very acutely and sharply tetragonal, brownish, glabrous; nodes very conspicuously annulate; principal internodes 1—3.3 cm. long; leaf-scars borne on very short and more or less appressed sterigmata; leaves decussate-opposite, sometimes unequally paired or only one of a pair developed (in which case it is tremendously larger than the nearby leaves); petioles slender or stoutish, elongate, 2—7.5 cm. long on mature leaves, variable, glabrous, usually deeply canaliculate above; leaf-blades chartaceous, fragile, usually rather dull grayish-green on both surfaces, elliptic, 4.5—20 cm. long, 2—8.4 cm. wide, bluntly acute or short-acuminate (rarely emarginate, sometimes long-acuminate) at the apex, entire, abruptly acuminate at the base and more or less prolonged into the petiole, bearing 1 or 2 pairs of large elongate glands on the prolongation beneath, very obscurely pulverulent on both surfaces or glabrous; midrib stout, plane above, prominent beneath; secondaries slender, 5—7 pairs, arcuate-ascending, not very plainly anastomosing, prominulent on both surfaces or (usually) more or less obscure above; vein and veinlet reticulation fine, abundant, slightly prominulent on both surfaces or obscure above, often plane beneath; racemes axillary and terminal, elongate, erect or nutant, 13.5—34 cm. long, 1—2 cm. wide, mostly simple (or the terminal one sometimes with 2 short branches at the base), the axillary ones usually only one per node, the second member of the pair short and abortive, rather loosely many-flowered; peduncles slender, 1—3.3 cm. long, minutely puberulent, pulverulent, or glabrate, often with several bract-bearing or bractlet-bearing nodes; rachis slender, puberulent or pulverulent; pedicels about 2.5 mm. long, puberulent; bracts foliaceous, few, lanceolate; bractlets linear, spatulate, or narrowly lanceolate; prophylla linear-setaceous, 1—1.8 mm. long, subulate; calyx cylindric, 2—2.5 mm. long, rather fleshy, subglabrous, 5-nerved, its rim truncate, very minutely and regularly 5-denticulate or subsinuate, short-pilose with white hairs on the margin; corolla short-exserted, surpassing the calyx by about 5 mm., its tube cylindric, sometimes ampliate toward the apex, the limb expanded, spreading, 5-lobed, the lobes obovate, broad, crisped along the margins, very obtuse at the apex, venose, the upper ones about 1.5 mm. long, the lower ones sometimes larger and to 2 mm. long, the median one broader and emarginate; stamens included, inserted at the middle or at about 1/3 the height of the corolla-tube; filaments about 3 mm. long; anthers oblong, about 0.7 mm. long; style shorter than the stamens, about 3 mm. long, thickened at the apex, minutely bilobed, pilose beneath the apex; fruiting-calyx shallowly campanulate, expanded, indurated, 1—2 mm. long, about 5 mm. wide, 5-ribbed, minutely puberulent, its rim irregularly lobed or very broadly 5-angulate; fruit subglobose or oblong, 4—5 mm. long and wide, glabrous, fleshy, 2-lobed, black and wrinkled in drying, with 2 pyrenes, the pyrenes osseous, 2-locular.

The type of this species was collected by C. Jurgensen (no. 259) — in whose honor it is named — at Trapiche de la Concepcion, southwest of Oaxaca, in the state of Oaxaca, Mexico, in June, 1845, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. The printed labels say "Juillet 1845", but a longhand inscription on an isotype at Geneva plainly states that the collection was made in "June".

The species is apparently very variable as to petiolar length and leaf-blade size. Immature leaves are very misleading, since they do not even hint at the tremendous elongation of petiole (and blade) which follows later. The annulate nodes are extremely conspicuous, as they are also in *C. affine* D. Don and *C. pterocladum* Donn. Sm., with the former of which herbarium material has been abundantly confused. Briquet states that it is related to *C. caudatum* "Sieb." and to *C. quadrangulare* Jacq. [=*C. spinosum* L.], but the relationship is obviously much closer to *C. affine* and *C. pterocladum*. It has been collected in anthesis in January, February, and June, and in fruit in February and June.

C. longipes is based on *Edward Palmer 1839* from Nayarit, Mexico. The labels on Macbride's photograph no. 24623 are inscribed "*Jurgens 259*" through an error in transcription. The species is very close to *C. affine*, which is a very variable species, In all, 19 herbarium specimens, including the types of all the names involved, and 10 mounted photographs have been examined.

Citations: MEXICO: Guerrero: *Langlassé 927* (B). Nayarit: *Edw. Palmer 1839* (Cp, F—707723, G, W—305273, W—567807), *2064* (W—305639). Oaxaca: *Jurgensen 259* [Macbride photos 24623] (B—photo of cotype, Cb—type, Cb—isotype, F—695193—isotype, F—772027—photo of isotype, K—photo of isotype, Kr—photo of isotype, N—isotype, N—photo of isotype, N—photo of isotype, S—photo of isotype, Z—photo of isotype), *260* (K, N—photo, Z—photo). Sinaloa: *Goldman 375* (Gg—228602, N, W—360296); *Rose, Standley, & Russell 14905* (G, G, W—637781). State undetermined: *Galeotti s. n.* (V).

CITHAREXYLUM KARSTENI Moldenke in Fedde, Repert. 37: 227—228. 1934.

Literature: Moldenke in Fedde, Repert. 37: 227—228. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 19. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 31 & 88. 1942; Moldenke, Alph. List Cit. 1: 10, 169, 221, & 243 (1946) and 2: 337, 424, 603, & 643. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 66. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 59 & 179. 1949; Moldenke, Alph. List Cit. 3: 694, 758, 805, & 885 (1949) and 4: 1005, 1006, 1043, 1069, 1070, & 1078. 1949.

Large shrub or tree, to 6 m. tall; branches and branchlets slender, obtusely or acutely tetragonal, gray or brown, more or less hirtellous-puberulent or glabrous, often striate-ribbed; twigs and young shoots slender, acutely tetragonal, brown, densely hirtellous-pubescent; nodes annulate; principal internodes 0.8—5.5 cm. long; leaf-scars large and ampliate, borne on very short appressed sterigmata; leaves decussate-opposite; petioles slender, 7—20 mm. long, densely pubescent; blades chartaceous or submembranous, uniformly green on both surfaces or usually blackening above in drying, dull or subnitid, oblong or ovate to ovate-elliptic, 2.9--11.1 cm. long, 1.5--4.8 cm. wide, acute or short-acuminate at the apex, entire or sometimes sparingly serrate with 4--6 blunt appressed teeth above the middle, abruptly acute or subacuminate at the base, bearing a pair of inconspicuous elongate glands at the very base beneath, sparsely or densely short-pubescent or puberulent above (especially along and near the midrib), densely hirtellous or subvelutinous-pubescent beneath; midrib slender, prominulent beneath; secondaries slender, 4 or 5 pairs, arcuate-ascending, obscurely or not at all anastomosing, prominulent beneath; vein and veinlet reticulation fine, often obscure; racemes axillary and terminal, simple or bearing a pair of branches at the base, erect or nutant, the main racemes 4--15 cm. long, about 1 cm. wide, the lateral branches almost as long as the central raceme, densely many-flowered; peduncles slender, 5--17 mm. long, densely pubescent, tetragonal; rachis slender, densely brown-pubescent like the p eduncles; pedicels filiform, 1--2 mm. long, pubescent; bracts and bractlets absent; prophylla linear-subulate, 1--2 mm. long, pubescent; calyx campanulate, 2.3--3.3 mm. long, 2.3--2.8 mm. in diameter, more or less 5-costate, pubescent, the rim 5-dentate, the teeth triangular, about 0.5 mm. long, 1 mm. wide at the base, acute at the apex; corolla hypocrateriform, varying from greenish or whitish to cream-colored or yellowish, its tube about 2.6 mm. long, about 1.4 mm. wide at the base and to 2.6 mm. wide at the apex, glabrous externally, densely pilose at the throat within, the limb 5-parted, the lobes very variable in size, oblong-lingulate, about 2 mm. long and 1.3 mm. wide, rounded at the apex; stamens 5, included, 4 subequal and inserted about 1.3 mm. below the mouth of the corolla-tube, the filaments about 0.6 mm. long, the anthers ovate, about 0.7 mm. long and 0.6 mm. wide, the fifth stamen much smaller; pistil included; style rather short, about 1.5 mm. long, glabrous; stigma very shortly 2-lobed; ovary obovate, about 1.6 mm. long and wide, glabrous; fruiting-calyx indurated, shallowly campanulate or patelliform, to 2.5 mm. long and 5 mm. wide, puberulent or pubescent, its rim subtruncate, entire or obsoletely 5-angulate; fruit subglobose, 5--6 mm. long and wide, fleshy, glabrous, green and reddish-tinged when immature, becoming brownish or red to black when mature, black and wrinkled in drying, 2-lobed.

The type of this species was collected by José Jerónimo Triana (no. 2071) at Càqueza, near Bogotá, Cundinamarca, Colombia, at an altitude of 2000 meters, between 1851 and 1857, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. The species is said to inhabit dry banks and plains at altitudes of 1000--2000 meters. It has been confused with C. cinereum L. [=C. fruticosum L.] in herbaria. André describes it as a tree to 6 m. tall, with elongate branches and whitish flowers. Haught reports it "abundant" in Cundinamarca. It has been collected in anthesis in February, April, June, July, and November, and in fruit in January, April, July, September, and November.

The Pennell collection differs somewhat from the usual form in its almost glabrate branches and branchlets and its firmer, smaller, non-discoloring leaves, with their venation obscure above, but in all other respects is identical with this species.

The leaf-blades of *C. karsteni* are often decidedly velutinous beneath (*e.g.*, *Rusby & Pennell 366* in the Britton Herbarium), and this pubescence in such specimens usually extends also to the petioles, twigs, branchlets, peduncles, rachis, pedicels, calyx, fruiting-calyx, and to a lesser extent to the upper leaf-surfaces and older branches.

In all, 37 herbarium specimens and 8 mounted photographs, including the type, have been examined.

Citations: COLOMBIA: Boyacá: *André K.1552* (K); *Karsten s.n.* [um Sogamozo] (L). Cundinamarca: *André 1334* (K, N), *1500*, in part (F--533614), *1675* (K, N); *Dugand 3544* (W--1852306); *H. García y Barriga 4851* (W--1594224); *Goudot s.n.* [Aype] (K, P), *s.n.* [Choachi] (K, P), *s.n.* [Pandi] (P); *Haught 5849* (N); *Karsten s.n.* [Aype] (X), *s.n.* [Caqueza] (V); *Lehmann 8778* (B, F--689798, K); *Mutis 4372* (W--1561459); *F. W. Pennell 1870* (E--843883, G, N, N, W--1041983); *Triana 262* [3706-1] (Hn), *2071* [Macbride photos 28395] (B--photo of type, Bm--isotype, Cb--isotype, Ed--isotype, F--830279--photo of isotype, K--photo of type, Kr--photo of isotype, N--isotype, N--photo of type, N--photo of isotype, P--type, S--photo of type, V--isotype, Z--photo of type), *3706* (Bm). Huila: *E. L. Little 8968* (N, W); *Rusby & Pennell 366* (N).

CITHAREXYLUM KARSTENI var. LANCEOLATUM Moldenke in Fedde, Repert. 37: 228. 1934.

Literature: Moldenke in Fedde, Repert. 37: 228. 1934; Apolinar-Maria, Revist. Acad. Colomb. 1: 358. 1937; Moldenke, Geogr. Distrib. Avicenn. 19. 1939; Moldenke, Suppl. List Invalid Names 1 & 16. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 31 & 88. 1942; Moldenke, Alph. List Cit. 1: 11, 133, 135, 195, 243, 317, & 319 (1946), 2: 348 & 643 (1948), 3: 912 (1949), and 4: 1071, 1076, & 1078. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 59 & 179. 1949; Moldenke, Phytologia 4: 120. 1952.

Illustrations: Apolinar-Maria, Revist. Acad. Colomb. 1: 358 [as *C. cinereum*] (colored). 1937.

This variety differs from the typical form of the species in its narrower, lanceolate or oblong-lanceolate leaf-blades, which are 3--10.5 cm. long and 0.8--2.5 cm. wide. It is described as a small tree, to 6 m. tall; trunk 5--10 cm. in diameter at breast height; bark gray or blackish, smooth or slightly fissured; racemes often very numerous, axillary and terminating short axillary twigs, simple or with 2 basal branches almost as long as the central part; calyx green; corolla varying from white or greenish-white to greenish-yellow, clear yellow-green, pale-yellow, or yellow; fruit in pendulous racemes, at first orange, then dark-purple or black, fleshy, 2-seeded.

The type of the variety was collected by Friedrich Carl Lehmann (*no. 8718*) at Garzon, above Tolima, department of Tolima, Colombia, at an altitude of 500—1200 meters, and is deposited in the Gray Herbarium at Harvard University. Collectors have found the plant in dry thickets, cleared areas of thickets, floodplains, and on "xeric flats apparently rather recently flooded, heavily grazed, the dominant species being *Jatropha gossypiifolia*, *Acacia farnesiana*, *Cereus* sp., *Opuntia* sp., *Melocactus* sp., etc." Mason says that it resembles the genus *Rhamnus*, and that it is found on dissected plains or badlands. It has been found at altitudes of 500 to 3100 meters.

The "*Citharexylum cinereum* L." illustrated in color by H. Apolinar María in his Vocab. Term. Vulg. Hist. Nat. Colomb. (Revist. Acad. Colomb. 1: 358. 1937) and described in his text as *C. tomentosum* H.B.K. is actually *C. karsteni* var. *lanceolatum*. The common names "agracejo" and "palo blanco" which he lists and which I erroneously cited in 1940 and in Phytologia 2: 97 (1944) as *C. tristachyum* Turcz., a Cuban species, actually apply to *C. karsteni* var. *lanceolatum*. "Agracejo" also applies to *C. dawei* Moldenke and to *C. fruticosum* L., while "palo blanco" is a name given also to *C. kunthianum* Moldenke and to *Rehdera penninervia* Standl. & Moldenke. Other common names recorded for *C. karsteni* var. *lanceolatum* are "chibero" and "maiz tostado". It has been collected in anthesis in February, April, June, August, November, and December, and in fruit in February, June, and August. In all, 34 herbarium specimens, including the type, and 7 mounted photographs have been examined.

Citations: COLOMBIA: Cundinamarca: *André 1500*, in part (K, N); *Arbeláez 2542* (W—1615651); *Cuatrecasas 9663* (W—1795909); *Cuatrecasas & Jaramillo 11992* (W—1850848); *Estanislas Fel. s.n.* [Apolinar-María 513] (F—990258); *Schultze 199* (B). Huila: *Fosberg 19317* (N, N); *Little 7262* (N), *7316* (N), *8149* (N), *8437* (N), *8967* (N), *9058* (N); *H. L. Mason 13799* (N, W—2047881). Tolima: *Goudot s.n.* [Honda] (P); *F. C. Lehmann 8717* (Cb, F—559896, F—578230, G, K, Le, N, N, N—photo, V, Z—photo), *8718* (B—photo of type, F—559897—isotype, F—578228—isotype, G—type, K—isotype, K—photo of type, Le—isotype, N—isotype, N—photo of type, Qu—isotype, S—photo of type, Z—photo of type).

CITHAREXYLUM KERBERI Greenm., Field Columb. Mus. Publ. Bot. 2: 187—188. 1907.

Literature: Greenm., Field Columb. Mus. Publ. Bot. 2: 187—188. 1907; Prain, Ind. Kew. Suppl. 4: 49. 1913; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Alph. List Common Names 1. 1939; Moldenke, Suppl. List Common Names 1. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 287 (1946) and 2: 607. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 66. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949; Moldenke, Alph. List Cit. 3: 714 (1949) and 4: 1020 & 1057. 1949; Moldenke, Phytologia 3: 465. 1951.

Shrub or tree; branches and branchlets medium, obtusely or subacutely tetragonal, not margined, gray, obscurely pulverulent-puberulent or subglabrous; twigs and young shoots more slender, brown, densely short-pubescent; nodes obscurely or not at all annulate; principal internodes 1—6.8 cm. long; leaf-scars subsessile or on extremely short and inconspicuous sterigmata; leaves decussate-opposite, often unequally paired; petioles slender, 3.5—10 mm. long, short-pubescent or puberulent; leaf-blades membranous or subchartaceous, very dark-green on both surfaces, blackening in drying, broadly oblong or elliptic, 3—14 cm. long, 2.1—6.6 cm. wide, short-acuminate at the apex (sometimes rounded or emarginate on small and stunted leaves), entire, acute or cuneate into the petiole at the base, sparsely strigillose above, becoming glabrous, densely tomentose-pubescent with short brownish hairs beneath, with a pair of black glands at the base; midrib slender, mostly plane above, prominent beneath; secondaries slender, 6—10 pairs, plane or very slightly subimpressed above (on thicker leaves), prominulous beneath, arcuate-ascending, not conspicuously anastomosing, often obscure above; vein and veinlet reticulation obscure above, more or less prominulous beneath; racemes terminating short branchlets, erect or nutant, simple, 15—18 cm. long, to 2.6 cm. wide (!), loosely many-flowered; peduncles slender, 2—3.2 cm. long, short-pubescent; rachis slender, short-pubescent or canescent; pedicels filiform, less than 1 mm. long or obsolete; bracts few, foliaceous, lanceolate; bractlets absent; prophylla linear, 1—3 mm. long; calyx tubular, 6—7 mm. long, pubescent on both surfaces, its rim subulately 5-dentate; corolla hypocrateriform, about twice as long as the calyx, 12—15 mm. long, puberulent in the throat at the base of the lobes and in the upper part of the tube, otherwise glabrous, the tube 8—10 mm. long, the lobes obovate to obovate-cuneate, 3—4.5 mm. long, about 2/3 as broad; perfect stamens 4, included, the fifth much reduced, often only a staminode; style glabrous; ovary glabrous; fruit elliptic, somewhat more than 2.5 cm. long and 2 cm. wide, hard, not fleshy, sparsely verruculose.

The type of this species was collected by Edmund Kerber (no. 430) — in whose honor it was named — somewhere in Mexico, and is deposited in the United States National Herbarium at Washington. It has been collected in flower and fruit in May. Common names reported are "aceitumillo" and "aceitunillo". In Java it has been confused with C. laetum Hiern. In all, 20 herbarium specimens, including the type, and 5 mounted photographs have been examined.

Citations: MEXICO: Vera Cruz: Matuda 1424 (Dp—28976, Mh, Mi, Mi, Mi, Mi, N, N, N). State undetermined: Kerber 430 (B—photo of type, K—photo of type, N—isotype, N—photo of type, S—photo of type, W—48149—type, W—1323212—isotype, Z—photo of type). CULTIVATED: Java: Mus. Hort. Bot. Bogor. XI.G.50 (Bz, Bz—25731, N), XI.G.52 (Bz—25736, Bz—26527, N), XI.G.52a (Bz, N).

CITHAREXYLUM KOBUSKIANUM Moldenke, Geogr. Distrib. Avicenn. 23, nom. nud. (1939); Phytologia 1: 441—442. 1940.

Literature: Moldenke, Geogr. Distrib. Avicenn. 23. 1939; Moldenke, Phytologia 1: 441—442. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34 & 88. 1942; Bol. Mus. Hist. Nat. Jav. Prado 7: 246. 1943; Salisb., Ind. Kew. Suppl. 10: 53. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 67. 1948; Moldenke, Alph. List Cit. 2: 581 (1948) and 3: 838. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 71 & 179. 1949.

Tree; branches medium-slender, grayish, glabrous; youngest twigs very slender, brownish, minutely puberulent; nodes somewhat ampliate; principal internodes 1—4 cm. long; older leaf-scars large, prominent, corky; leaves decussate-opposite; petioles very slender, 2—5 mm. long, minutely puberulent; leaf-blades chartaceous, uniformly dull-green on both surfaces, oblong or oblong-elliptic, 2.5—5 cm. long, 1.5—2.2 cm. wide, acute and very shortly apiculate at the apex, entire, acute or shortly acuminate at the base, very sparsely puberulent above, densely puberulent beneath; midrib slender, subimpressed and densely puberulous above, prominulous beneath; secondaries slender, 7—10 per side, slightly arcuate-ascending, obscure above, slightly prominulous beneath; veinlet reticulation indiscernible above, very slightly prominulous beneath; inflorescence axillary, racemiform, to 6.5 cm. long, many-flowered; rachis slender, puberulent; corolla white-violet; fruiting-calyx very light and herbaceous, puberulent externally; fruiting-pedicels about 3 mm. long, brownish-puberulent; fruit subglobose or oblong, about 5 mm. long and 4 mm. wide, fleshy, glabrous.

The type of this species was collected by Constantin von Jelsky (Raimondi 6303) at Chota, Chichayro, Cajamarca, Peru, on September 10, 1877, and is deposited in the herbarium of the Botanisches Museum at Berlin. The published list of Raimondi's herbarium gives the collection date as "Agosto de 1877", but the ladel on the type is plainly inscribed "10. Sept." The species is named in honor of Dr. Clarence Emmeren Kobuski, who has produced an excellent monograph of the genus Priva. The collector's name is misspelled "Jelski" on the labels. The species has been found in anthesis in June. In all, 3 herbarium specimens, including the type, and 5 mounted photographs have been examined.

Citations: PERU: Cajamarca: Jelsky s.n. [Raimondi 6303] (B—type, E—photo of type, N—isotype, N—photo of type, S—photo of type, W—photo of type, Z—photo of type). La Libertad: López Miranda 648 (W—2058262).

CITHAREXYLUM KRUKOVII Moldenke in Fedde, Repert. 37: 228—229. 1934.

Literature: Glaz., Bull. Soc. Bot. France Mém. 3: 545. 1911; Moldenke in Fedde, Repert. 37: 228—229. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 25. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 36 & 88. 1942; Moldenke, Alph. List Cit. 1: 237 (1946) and 2: 621. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 67. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76 & 179. 1949.

Tree, to 7 m. tall; branches and branchlets thick, tetragonal, more or less 4-margined, glabrous; principal internodes 1.3—7.5 cm. long; leaf-scars thick, ascending, about 4 mm. long; leaves leaves decussate-opposite; petioles thick, 8—11 mm. long, subverruculose, deeply canaliculate above, glabrous; leaf-blades firmly chartaceous or subcoriaceous, elliptic, 7.7—14.8 cm. long, 5.8—9.1 cm. wide, obtuse or acute at the apex, entire, acute at the base, glabrous above, densely velutinous-pubescent beneath; secondaries 5—9 per side, prominulent beneath, arcuately anastomosing near the margins; racemes axillary, opposite, 4.5—10 cm. long, about 1.8 cm. wide, loosely many-flowered; peduncles and rachis slender, puberulent; pedicels absent; calyx campanulate, about 5.2 mm. long and 3.9 mm. wide, puberulent, irregularly marked with depressed crateriform glands, the rim conspicuously 5-lobed, the lobes triangular, about 1.8 mm. long, about 2.3 mm. wide at the base, obtuse or subapiculate at the apex; corolla hypocrateriform, white or yellow, its tube broadly cylindric, straight, about 7 mm. long, uniformly 2.3 mm. wide, glabrous externally, densely pilose in the throat within, the limb 5-parted, the lobes subspatulate-lingulate, about 3.6 mm. long and 2 mm. wide, obtuse at the apex; stamens 4, distinctly didynamous, included, two inserted about 1.8 mm. and the other two about 2.5 mm. below the mouth of the corolla-tube; filaments about 0.7 mm. long; anthers oblong-ovate, about 1 mm. long and 0.5 mm. wide; pistil included; style rather thick, about 1.8 mm. long, glabrous; stigma very shortly 2-lobed, the lobes about 0.6 mm. long; ovary rounded, about 1.5 mm. long and wide, glabrous, inserted on a short glabrous 10-dentate disk which closely invests its base; fruiting-calyx and fruit not known.

The type of this species was collected by Boris Alexander Krukoff (*no. 2048*) — in whose honor it was named — on terra firma in the high forest near Lorenda, in the region of Rio Grajahu, Maranhão, Brazil, on March 27, 1933, and is deposited in the Britton Herbarium at the New York Botanical Garden. It has been found also in woods and secondary forests, flowering in January, June, and July. It is very closely related to *C. glaziovii* Moldenke, which, however, has different venation in the leaf-blades, the flowers are larger, the calyx is heavier, and the pubescence is more velutinous. It is also closely related to *C. laetum* Hiern, and, in fact, the *Glaziou 11245* collection cited below was reported by the collector in the reference listed above as *C. laetum*. In all, 8 herbarium specimens, including the type, have been examined.

Citations: BRAZIL: Maranhão: *Fróes 25678* (N); *Krukoff 2048* (B—isotype, Cb—isotype, K—isotype, K—isotype, N—type). Minas Gerais: *Glaziou 11245* (B, P).

CITHAREXYLUM KUNTHIANUM Moldenke, Phytologia 2: 51. 1941.

Synonymy: *Citharexylum tomentosum* H.B.K., Nov. Gen. & Sp. Pl. 2: 258. 1817 [not *C. tomentosum* Poir., 1811, nor Sessé & Moc., 1831, nor Klotzsch & Karst., 1940]. *Citharexylon tomentosum* Humb.

& Bonpl. ex Steud., Nom. Bot., ed. 1, 202. 1821. Citharexylon tomentosum H.B.K. apud Walp., Repert. 4: 76. 1845. Citharexylum tomentosum Kunth apud Schau. in A. DC., Prodr. 11: 513. 1847.

Literature: Poir. in Lam., Encycl. Méth. Suppl. 2: 368. 1811; H.B.K., Nov. Gen. & Sp. Pl. 2: 258. 1817; Walp., Repert. 4: 76. 1845; Schau. in A. DC., Prodr. 11: 613. 1847; Jacks., Ind. Kew. 1: 550. 1893; Apolinar-Maria, Revist. Acad. Colomb. 1: 358. 1937; Moldenke, Geogr. Distrib. Avicenn. 19. 1939; Moldenke, Suppl. List Common Names 6 & 16. 1940; Moldenke, Phytologia 2: 51. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 31, 32, & 88. 1942; Moldenke, Phytologia 2: 96. 1944; Moldenke, Alph. List Cit. 1: 10, 11, 157, 166, 170, 243, & 273 (1946) and 2: 328, 349, 460, 529, 557, 573, 603, & 642. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 67. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 59, 62, & 179. 1949; Moldenke, Alph. List Cit. 3: 691, 758, 808, 817, & 950 (1949) and 4: 1005, 1006, 1040, 1047, 1073, & 1075. 1949; Moldenke, Phytologia 3: 484. 1951; Salisb., Ind. Kew. Suppl. 11: 55. 1953.

Tall shrub or small tree, to 15 m. tall; trunk to 40 cm. in diameter; wood white, heavy, durable; bark gray and smooth or light brown-tan and peeling off in long thin pieces or layers; branches alternate, terete, glabrous; branchlets medium, obtusely tetragonal, light-brown, densely furfuraceous-puberulent or tomentose with ochraceous or incanous to cinereous hairs, eventually becoming subglabrate; twigs more slender, densely furfuraceous-tomentose with ochraceous hairs, occasionally densely villous-tomentose; nodes annulate; principal internodes 1.2--8.4 [--12] cm. long; leaf-scars borne on very short flattened sterigmata; leaves decussate-opposite or whorled in 4's; petioles slender or stoutish, 1--3.5 cm. long, rather densely furfuraceous-tomentose, sometimes bearing 1 or 2 large glands similar to those on the base of the blades; leaf-blades firmly chartaceous, dark-green above, lighter beneath, ovoid-elliptic or elliptic, 4.5--22 cm. long, 3--10 cm. wide, acute or short-acuminate at the apex (often bluntly so), entire, broadly acute or subacuminate at the base, very lightly furfuraceous-puberulent (especially along the midrib) or scabrellous above (more densely so when young), very densely tomentose beneath with incanous or ochraceous hairs, with a pair of blackish glands at the very base, often with scattered glands over the whole lower surface (conspicuous because no tomentum covers them); midrib slender, very prominent beneath, often subimpressed and furfuraceous above; secondaries very slender, about 10 pairs, prominulent beneath, often subimpressed above, ascending at an angle of about 45°, not very arcuate; vein and veinlet reticulation obscure or very slightly impressed above, prominulent but mostly hidden beneath; racemes axillary and terminal, erect or nutant, simple or compound with 1--3 pairs of branches, 3.5--22 cm. long, 1--1.5 cm. wide, densely many-flowered; peduncles and rachis slender or stoutish, densely furfuraceous-tomentose like the twigs, the former 1.5--3.5 cm. long; bracts foliaceous, spatulate, densely furfuraceous-tomentose, often absent; bractlets linear, to 1 cm. long, densely furfuraceous, often absent; pedicels obsolete or to 1 mm. long; prophylla linear, about 1 mm. long, mostly hidden by the tomentum; flowers fragrant, dense; calyx subsessile, campanulate or cyathiform, clear-green when fresh, about 4 mm. long, densely incanous-tomentose on both surfaces, its rim shortly and obtusely dentate; corolla white or pale-yellow, infundibular, its tube equaling or slightly surpassing the calyx, very densely tomentose-villous in the throat, the lobes subrotund, pilose within; stamens 4 (or 5), inserted at the apex of the corolla-tube, included; filaments very short; anthers linear; fruiting-calyx indurated, cupuliform, about 3 mm. long and 6 mm. wide, furfuraceous-tomentose, its rim rather deeply and irregularly 5-lobed, with acute or rounded lobes; fruit globose or oblong, about 6 mm. long and 5 mm. wide, rather fleshy, green when immature, red or scarlet when ripe, nitid, glabrous, wrinkled and 2-sulcate in drying, composed of 2 pyrenes, the pyrenes 2-locular, the cells 1-seeded.

The type of this species was collected by Friedrich Heinrich Alexander von Humboldt and Aimé Jacques Alexandre Bonpland (no. 5898) in the valley of the Río Cauca, between the village of Tulu and the town of Buga, in the vicinity of Popayan, Valle del Cauca, Colombia, at an altitude of 500 hex., and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. The species is named in honor of Carl Sigismund Kunth, who prepared the text of the work in which this species was first described. It has been collected in thickets, dry and semidesert thickets, near watercourses through dry terrain, thickets along streams, and on "brushy river bluffs with seeps of water, generally rather dry." Little says that it is "common on cleared hillsides, forms thickets". It has been found at altitudes of 200 to 2225 meters, blooming from September to January and in March, May, and July, and in fruit from July to September and December to March.

The Lehmann 799 collection, cited below, is remarkable in that its leaves are quaternate at every node and the internodes are to 12 cm. in length. Torrey reports that the ovary is 4-celled, with a solitary ovule in each cell. Duque states that the wood is used for the handles of farmers' tools. Triana 2112 is noteworthy because of its extremely long and villous tomentum on the twigs, peduncles, pedicels, rachis, and corollas. Mostly in this species the tomentum is merely furfuraceous or furfuraceous-tomentose. Triana 3738 [20] has a large leaf with a truncate base and very heavy long rachids, as are seen in C. subflavescens Blake, and may actually represent that species. The Dryander 50 cited below may have come from Valle del Cauca, since its label is inscribed merely "Yumbo".

Specimens of this species have been confused in herbaria with the genus Buddleia of the Loganiaceae and with Ehretia and Varronia of the Ehretiaceae. The colored picture in H. Apolinar-Maria's Vocab. Term. Vulg. Hist. Nat. Colomb., published in Revist. Acad. Colomb. 1: 358 (1937), labeled "C. cinereum", and described in the text as C. tomentosum H.B.K., is actually C. karsteni var. lanceolatum Moldenke. The vernacular name "agracejo" which he records doubtless also belong the the latter variety. "Palo blanco" and "asusena" apparently apply to C. kunthianum — the first of these, however, is also applied to C. karsteni var. lanceolatum and to Rehdera penninervia Standl. & Moldenke. The name "cotelet tomenteux", recorded by me in Phytologia 2: 96 (1944), apparently belongs to C. fruticosum var. villosum (Jacq.) O. E. Schulz, since it applies to C. tomentosum Poir.

In all, 59 herbarium specimens, including the types of all the names involved, and 10 mounted photographs have been examined.

Citations: COLOMBIA: Cundinamarca: Antonio C. s.n. [Apolinar-María 81] (F—1007413); Goudot B.1 (K, P); Mutis 704 (W—1561461); Triana 20 (Bm), 3738 [20] (Jc). El Cauca: André 2467 (K), K.1550 (K); Dryander 50 (B); Haught 5128 (N); Holton 519 [La Paila] (D—611879, G, G, K, N, T, X); Karsten s.n. [Cauca] (V); Pittier 606 (B, W—530796); Sneidern 2816 (S); Triana 2029 (Ed), 2112 (B, Bm, Cb, P, V), 3738 [19] (Jc). Huila: Fosberg 19232 (N, N); Little 7464 (N), 7905 (N), 9247 (N). Nariño: Garganta Fábrega 532 (F—1273540). Tolima: Goudot s.n. [San Luis] (K, P). Valle del Cauca: Bonpland 1898 (N, P, P, P); Cuatrecasas 15364 (F—1334189, F—1334190, N), 23017 (N), 23691 (F—1341819); Duque 1736 (W—1744577); Humboldt & Bonpland 5898 [Herb. Willdenow 11476; Macbride photos 17602] (B—isotype, F—663031—photo of isotype, K—photo of isotype, Kr—photo of isotype, Mi—photo of type, N—photo of type, N—photo of isotype, N—photo of isotype, S—photo of isotype, P—type, Z—photo of type, Z—photo of isotype); F. C. Lehmann 799 (Bm, K, X), 1967 (B, K, W—938450); Pennell & Killip 6187 (G, W—1142046). State undetermined: Herb. Link s.n. [Am. mer.] (B). VENEZUELA: Federal District: Delgado 201 (W—1778780). CULTIVATED: Ecuador: Asplund 16986 (S).

CITHAREXYLUM LAETUM Hiern, Vidensk. Meddel. Naturhist. Kjøben. 1877: 104 [as "Citharexylon"]. 1877; Jacks., Ind. Kew. 1: 550. 1893.

Synonymy: Citharexylum laetum Hieron. ex Moldenke, Alph. List Common Names 7, 9, 16, 28, & 29, sphalm. 1939. Citharexylon laetum Hieron. ex Moldenke, Prelim. Alph. List Invalid Names 15, in syn. 1940.

Literature: Hiern, Vidensk. Meddel. Naturhist. Kjøben. 1877: 104. 1877; Warm., Symb. Fl. Bras. Cent. 710. 1877; Jacks., Ind. Kew. 1: 550. 1893; Glaz., Bull. Soc. Bot. France Mem. 3: 545. 1911; Moldenke, Alph. List Common Names 7, 9, 16, 28, & 29. 1939; Moldenke, Geogr. Distrib. Avicenn. 25. 1939; Moldenke, Prelim. Alph. List Invalid Names 15. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 36 & 88. 1942; Moldenke, Alph. List Invalid Names 13. 1942; Moldenke, Phytologia 2: 96—97. 1944;

Moldenke, Alph. List Cit. 1: 78, 90, 172, 215, 222, & 236. 1946; Moldenke, Phytologia 2: 385. 1947; Moldenke, Alph List Invalid Names Suppl. 1: 5. 1947; Moldenke, Alph. List Cit. 2: 332, 431, & 489 (1948), 3: 692, 736, 737, 824, 853, & 890 (1949), and 4: 1025 & 1106. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76 & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Moldenke, Phytologia 3: 286. 1950; Stellfeld, Trib. Farmac. 19 (10): 169. 1951.

Tree or shrub, to 7 m. tall; branches and branchlets rather stout, more or less tetragonal, brown, lenticellate, glabrate; nodes rather obscurely annulate; principal internodes 1.5—5 cm. long; leaf-scars large, borne on stout ascending sterigmata to 4.5 mm. long; leaves decussate-opposite, or subopposite on young shoots; petioles rather stoutish, 1—2.7 cm. long, canaliculate above, glabrate; leaf-blades firmly chartaceous, dark-green above, lighter beneath, shiny on both surfaces, oblong or oblong-elliptic to elliptic, 7—18.5 cm. long, 2—9.4 cm. wide, acute or short-acuminate (rarely rounded and subemarginate) at the apex, entire, acute at the base and prolonged into the petiole, bearing a pair of narrow and elongate or often extremely large and conspicuous glands (which are to about 4 mm. long and 2.5 mm. wide) on the prolongation (except on the smallest leaves), glabrous on both surfaces; midrib stout, plane or subimpressed (on older leaves) above, prominent beneath; secondaries slender, 7—10 pairs, arcuate-ascending (often only slightly arcuate), plane or impressed (on older leaves) above, prominulent beneath; vein and veinlet reticulation fine, abundant, slightly prominulent and conspicuous to the last detail beneath, the larger parts often subimpressed or sometimes prominulent above; racemes terminal, erect, 7—27 cm. long, rather loosely many-flowered, simple; peduncles stoutish, more or less tetragonal, 7—10 mm. long, brown, glabrate; rachis stoutish, brown, glabrate or minutely puberulent; pedicels obsolete or to 2.5 mm. long (in fruit); bracts and bractlets absent; prophylla setaceous-subulate, about 1 mm. long; calyx light or heavy, 3—5 mm. long; corolla whitish; fruiting-calyx greatly incrassate and indurated, shallowly cupulifrom or subpatelliform, about 6 mm. long and 12 mm. wide, more or less scarious at the rim, not ribbed, glabrous, its rim deeply and rather irregularly 5-lobed; fruit oblong, large, to 17 mm. long and 11 mm. wide, not very fleshy, dull, glabrous.

The species is based on several cotype collections, including two collected by Johannes Eugenius Bülow Warming (nos. 601 and 790) at Babosa and Lagoa Santa, the latter on March 14, 1864, Minas Gerais, Brazil, and deposited in the herbarium of the Universitetets Botaniske Museum at Copenhagen. It is said to inhabit woods and mountainous regions, especially areas near rivers and lakes, and has been collected in anthesis from October to January and in May, and in fruit in January and April. It is remarkably variable in the size of its leaves, the character of the leaf-venation on the upper surface, the basal glands, the calyx, and the flowers in general. It may well be that several taxa are herein included and further study may differentiate.

The Burchell specimens are remarkable small-leaved and short-racemed. *Pohl 146* has its uppermost leaves exhibiting extremely large basal glands, among the largest seen in the entire genus, while the lower leaves show no trace of glands. These same large and very conspicuous glands are seen on *Fróes 1719*, which was distributed as this species, but which is now the type collection of *C. ulei* var. *calvescens* Moldenke. Many other collections show only narrow and more or less elongate inconspicuous glands, or none at all. It is strange to note that on many specimens the largest basal glands seem to be borne on the youngest (apical) leaves, while the older (lower) leaves have inconspicuous glands or none at all (vid. *Mikan 5360* at Kew). Very young leaves are submembranous, while very old ones are very firm and stiff. Strange swellings of the midrib are frequently seen and may be due to gall insects (*e.g.*, *Warming s.n.* at Copenhagen). Some of the Warming specimens have the secondaries and larger veinlets distinctly impressed above; others have the entire venation prominulent above. On *Warming s.n.* at Copenhagen the calyx is very large and heavy, uniformly 5 mm. long, while on *Warming 790*, in the same herbarium, it is light and uniformly only 3 mm. long. In all other respects the two collections do not exhibit any tangible differences.

Specimens of this plant have been confused in herbaria with *C. cinereum* L. [=*C. fruticosum* L.], *C. myrianthum* Cham., and the *Ehretiaceae*. The *Glaziou 11245* cited by Glaziou in Bull. Soc. Bot. France Mém. 3: 545 (1911) as *C. laetum* is actually the closely related *C. krukovii* Moldenke. Unfortunately, the *nos. 2320* and *4588* which are *C. laetum* are not listed by Glaziou and so it is not immediately possible to determine where they were collected.

In my earlier works on the *Verbenaceae* I erroneously accredited this binomial to Georg Hans Emmo Wolfgang Hieronymus (1846—1921) — and in this I have been followed by Stellfeld — instead of to William Philip Hiern (1839—1925).

Common names recorded for *C. laetum* are "caffecillo", "coffee chocolate", "jacende", "jaglende", "Maria molle", "semina", and "tarumá branco". Of these, however, the last-mentioned applies to *Fróes 1719* only and therefore applies more correctly to *C. ulei* var. *calvescens*. "Maria molle" is also applied to *Vitex rufescens* var. *abludens* (Moldenke) Moldenke.

In all, 38 herbarium specimens, including the cotype collections, and 13 mounted photographs have been examined.

Citations: BRAZIL: Federal District: *Moldenke & Moldenke 19592* (N, Sm). Minas Gerais: *Warming 601* [Macbride photos 22774, in part] (Cp—cotype, F—687353—photo of cotype, Kr—photo of cotype, N—photo of cotype, N—photo of cotype, Z—photo of cotype), *790* [Macbride photos 22774, in part] (B—photo of cotype, Cp—cotype, F—687353—photo of cotype, K—photo of cotype, Kr—photo of cotype, N—photo of cotype, N—photo of cotype, S—cotype, S—photo of cotype, Z—photo of cotype), *s.n.* [Babosa, 14/12/64] (Cp), *s.n.*

[Babosa, 13 December] (Cp, P), s.n. [Lagoa Santa, 23/XI/64] (Cp), s.n. [Lagoa Santa] (Bm, Cp, N). Parana: Dusén s.n. [Morretes] (S). Rio de Janeiro: G. Gardner 733 (Bm, Cb, K, K); Miers s.n. [Organ Mts.] (Bm); Mikan 5360 [146] (K, V, V), s.n. [Rio de Janeiro] (Br); J. E. Pohl 146 (B). São Paulo: Burchell 3264 (K), 4377 (K, K); Campos Novaes 938 (W—389899); Saint-Hilaire C^{2}.1215 (N, P, P, P, P). State undetermined: Glaziou 2320 (Bm), 4588 (Bm); J. E. Pohl s.n. [Brasilia] (Br, Br, Mu—754); K. Richter s.n. [Herb. Schott] (Vu).

CITHAREXYLUM LANKESTERI Moldenke in Fedde, Repert. 37: 229. 1934.

Literature: Moldenke in Fedde, Repert. 37: 229. 1934; Standl., Field Mus. Publ. Bot. 18: 1001. 1938; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 17. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 22 & 88. 1942; Moldenke, Alph. List Cit. 1: 317 (1946) and 2: 633. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 68. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 39 & 179. 1949; Moldenke, Alph. List Cit. 3: 780. 1949.

Shrub or tree, to 7.5 m. tall; trunk to 26 cm. in diameter; branchlets rather stout, obtusely tetragonal, medullose, nigrescent in drying, densely stellate with short whitish or grayish hairs, often so densely so (on younger shoots) as to appear tomentose; nodes obscurely annulate; principal internodes 4.5—7.5 cm. long; leaf-scars borne on ascending sterigmata which are often 4—11.5 mm. long and densely stellate; leaves decussate-opposite; petioles stout, subtetragonal, margined, often flattened or deeply sulcate above, 2.3—3.5 cm. long, nigrescent in drying, densely stellate-pubescent; leaf-blades firmly chartaceous, very dark-green on both surfaces, shiny above, ovate-oblong or oblong-elliptic to obovate, 17—21 cm. long, 7.3—8.3 cm. wide, acuminate at the apex, entire, slightly subrevolute in drying along the margins, acute at the base and slightly prolonged into the petiole, bearing a pair of elongate glands on the prolongation, glabrous (except for the stellate midrib and secondaries) above, densely stellate-tomentose with many-branched hairs beneath; midrib stout, prominent but often decidedly flattened beneath, very slightly impressed above; secondaries slender or stoutish, 7—9 pairs, arcuate-ascending, plane or subimpressed above, prominulous beneath, not plainly anastomosing; vein and veinlet reticulation prominulous on both surfaces, abundant, conspicuous above to the last detail, mostly hidden by the pubescence beneath; racemes axillary and terminal, erect or nutant, simple or the terminal one often bearing a pair of lateral branches at its base, 10—27 cm. long, rather loosely many-flowered; peduncles slender, 5—7.5 cm. long, densely stellate-tomentose with canescent hairs; rachis slender, densely stellate-tomentose; pedicels slender, to 2 mm. long, stellate; bracts and bractlets absent; prophylla linear-subulate, to 3 mm. long, stellate; calyx campanulate-obconic, slightly curvate and borne asymmetrically on the pedicel, about 3.6 mm. long and 2.8 mm. wide, 5-costate.

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NOTES ON BROMELIACEAE, XI

Lyman B. Smith

DOMINICAN REPUBLIC

TILLANDSIA ARIZA-JULIAE L. B. Smith & Jiménez, sp. nov.

A T. bulbosa Hook., cui affinis, laminis foliorum subrectis, scapi bracteis supremis sine laminis, sepalis majoribus densissime lepidotis differt.

Stemless, 19 cm. high; leaves about 12, covered with fine closely appressed cinereous scales; sheaths orbicular, abruptly contracted into the blades, greatly inflated, 3-4 cm. long, forming a dense ovoid pseudobulb, green tinged with purple near the margin; blades involute-subulate, acuminate, strict, nearly straight, to 9 cm. long, 2-4 mm. in diameter; scape erect; scape-bracts imbricate, the lower subfoliaceous, the highest broadly ovate, apiculate, subchartaceous; inflorescence simple or few-branched; spike lanceolate, acute, complanate, 8 cm. long, rather lax, including the sepals densely vestite with appressed cinereous scales; rhachis slender, slightly alate; floral bracts imbricate at anthesis, ovate, acute, 30 mm. long, more than 3 times as long as the internodes, ecarinate, subchartaceous, nerved; flowers subsessile; sepals oblong, apiculate, 20 mm. long, posteriorly short-connate; petals tubular-erect, purple; stamens exserted; capsule slenderly cylindric, 3 cm. long. Pl. I, fig. 1: Inflorescence x 1/2; fig. 2: Sepal x 1.

Type in the U. S. National Herbarium, No. 2,228,156, collected on Pinus occidentalis Sw. near Hotel Montaña, between La Vega and Jarabacoa, Province of La Vega, Dominican Republic, altitude 500 meters, April 3, 1958, by Luis Ariza Julia and flowered in his garden in May 1958. Isotype in Herbarium of José de Js. Jiménez.

COLOMBIA

GUZMANIA DELICATULA L. B. Smith, sp. nov.

Ab omnibus speciebus generis foliis gramineis cum inflorescentia laxissime paniculata differt.

Stemless (?), the flowering shoot 45 cm. high; leaves subfasciculate, 8 dm. long, obscurely punctulate-lepidote; sheaths narrowly ovate, 12 cm. long, finely striate except for the dark castaneous base; blades graminiform, 15 mm. wide, flat, acuminate, green with broad pale margins beneath; scape erect, very slender, hidden by the leaves; scape-bracts linear, caudate-acuminate, exceeding the internodes; inflorescence bipinnate, very lax, 15 cm. long, glabrous except for the obscurely lepidote apices of the bracts; lower primary bracts like the scape-bracts, exceeding the branches, the upper ovate, apiculate, about equaling the sterile bases of the branches; branches subspreading, laxly few-flowered, slender, flexuous; floral bracts ovate, broadly acute, 8-12 mm. long, ecarinate, thin, nerved; flowers spreading; pedicels distinct, 6-8 mm. long; sepals spatulate, obtuse, 16 mm. long, unequally short-connate; petals naked; stamens included. Pl. I, fig. 3: Branch x 1; fig. 4: Sepal x 1.

Type in the Naturhistoriska Riksmuseet, Stockholm, collected at La Selva, Pueblo Rico, Department of Caldas, Colombia, altitude 1500 meters, January 28, 1946, by Kjell von Sneidern (No. 5391).

PITCAIRNIA SNEIDERNII L. B. Smith, sp. nov.

A P. volubilis L. B. Smith, cui affinis, foliis majoribus longe petiolatis, inflorescentia subdensa, floribus minoribus differt.

Stem over 12 cm. long, 5 mm. in diameter, dark castaneous, covered with the remains of old leaf-bases; flowering shoot 45 cm. high; leaves apparently all alike; sheaths ovate, 15 mm. long, pale-lepidote; petioles 19-30 cm. long, very slender, involute, glabrous, laxly serrate toward base with slender curved dark spines 1.5 mm. long; blades elliptic, cuneate, rounded to a short narrowly triangular apex, 30-33 cm. long, 8 cm. wide, glabrous, entire, flat except for a narrow median channel toward base; scape straight, slender, 30 cm. long, sparsely white-flocculose; scape-bracts erect and tightly enfolding the scape, lanceolate, acuminate, membranaceous, entire, sparsely white-lepidote, the lowest 14 cm. long; inflorescence simple, 15 cm. long, subdense, many-flowered, sparsely white-lepidote; rhachis slender; floral bracts linear-lanceolate, acuminate, to 15 mm. long, thin, reflexed with the flowers; pedicels slender, 5 mm. long; sepals narrowly triangular, acuminate, 15 mm. long, ecarinate; petals 20 mm. long, naked, color unknown; stamens included; ovary over 2/3 superior; ovules caudate. Pl. I, fig. 5: Leaf x 1/10; fig. 6: Flower x 1; fig. 7: Sepal x 1.

Type in the Naturhistoriska Riksmuseum, Stockholm, collected at Pueblo Rico, La Selva, Department of Caldas, Colombia, altitude 1500 meters, January 4, 1946, by Kjell von Sneidern (No. 5371).

ECUADOR

AECHMEA ABBREVIATA L. B. Smith, sp. nov.

A Ae. angustifolia Poepp. & Endl., cui valde affinis, laminis foliorum tenuibus basi angustatis, inflorescentia pauciramosa subdigitata, rhachibus spicarum gracilibus haud vel vix excavatis differt.

Stemless, propagating by slender stolons, the flowering shoot 30-47 cm. high; leaves about 9 in a funnelform rosette, 35-60 cm. long; subdensely vestite on both sides with coarse white appressed scales, subchartaceous when dry; sheaths elliptic, 6-10 cm. long, entire; blades ligulate, subacute and apiculate, narrowed at base but not petiolate, 25-35 mm. wide, flat, laxly serrate with slender spreading spines from 3 mm. long at the base of the leaf to almost imperceptible near the apex; scape erect, very slender, white-flocculose; scape-bracts lanceolate, acute, obscurely serrulate, membranaceous, red, all but the highest remote; inflorescence 5-branched, subdigitate with a short slender axis, sparsely white-flocculose; primary bracts like the scape-bracts but entire, the lowest nearly equaling the spikes; spikes oblong, densely distichous-flowered, to 4 cm. long; rhachis slender, flexuous, little if at all excavated; floral bracts broadly ovate, 4 mm. long; flowers sessile; sepals asymmetric with a minute terminal mucro, oblong, truncate, 4.5 mm. long; petals narrowly spatulate, obtuse, 15 mm. long, pale yellow except for the white apical third, bearing 2 long fimbriate scales at base; ovary subglobose, 6 mm. long, the epigynous tube shallow but distinct; placentae apical; ovules caudate. Pl. I, fig. 8: Leaf x 1/10; fig. 9: Inflorescence x 1/2; fig. 10: Spike x 1; fig. 11: Sepal x 2; fig. 12: Petal x 2.

Type in the Naturhistoriska Riksmuseum, Stockholm, collected on tree trunk in forest, Mera, Province of Napo-Pastaza, Ecuador, altitude ca. 1000 meters, November 17, 1955, by E. Asplund (No. 18472)

ECUADOR: Napo-Pastaza: Epiphytic in forest, near Rio Tigre, Mera, alt. 1100 m., Asplund 18573 (S).

AECHMEA STROBILACEA L. B. Smith, sp. nov.

A Ae. rubiginosa Mez, cui affinis, bracteis florigeris elongatis valde recurvatis, sepalis majoribus differt.

Leaves rosulate, over 2 meters long, covered beneath with appressed ferruginous scales, very laxly serrate toward base with retrorse curved teeth 4 mm. long, densely antrorse-serrulate toard apex; sheaths elliptic, ca. 15 cm. long; blades linear, acuminate, 55 mm. wide, flat; scape erect, not much over 10 cm. high, stout; scape-bracts erect, densely imbricate, ovate, acute, densely serrulate; inflorescence simple, strobilate, short-cylindric, 15 cm. long, 12 cm. in diameter, densely ferruginous-lepidote; floral bracts lance-triangular, long-acuminate, over 7 cm. long, densely serrulate, dull red, the apical part reflexed; flowers sessile, strongly compressed; sepals lance-triangular, subulate-acuminate, pungent, 36 mm. long, subequally short-connate, the posterior ones sharply carinate with the wings continuous on the ovary; petals and stamens unknown; ovary suborbicular, the epigynous tube broadly funnelform, 5 mm. deep; seeds flat, broadly elliptic, 8 mm. long. Pl. I, fig. 13: Floral bract x 1; fig. 14: Sepal x 1.

Type in the Naturhistoriska Riksmuseum, Stockholm, collected on ground in forest, Vera Cruz, Province of Napo-Pastaza, Ecuador, altitude ca. 900 meters, February 18, 1956, by E. Asplund (No. 19480).

GUZMANIA AEQUATORIALIS L. B. Smith, sp. nov.

A G. calamifolia André ex Mez, cui affinis, foliis breviter acutis, inflorescentia omnino densa, bracteis latioribus spicas haud superantibus, sepalis altiore connatis differt.

Stemless, flowering over 45 cm. high; leaves about 20 in an infundibuliform rosette, 45 cm. long, obscurely punctulate-lepidote throughout; sheaths elliptic, 10 cm. long, slightly paler than the blades; blades ligulate, acute, 4 cm. wide, green suffused with purple; scape erect, 6 mm. in diameter, scape-bracts erect, imbricate, closely enfolding the scape, the lower subfoliaceous, the upper with broadly ovate purple-striped base and triangular solid purple apex; inflorescence densely bipinnate, subglobose, 7 cm. long, very obscurely punctulate-lepidote, appearing glabrous; primary bracts like the upper scape-bracts, shorter than the axillary branches; spikes ellipsoid, stout, 4 cm. long, strobilate; floral bracts suborbicular, to 17 mm. long, exceeding the sepals, subcoriaceous and smooth, lustrous; flowers subsessile; sepals elliptic, obtuse, 14 mm. long, connate for 5 mm., nerved; petals white, the blades elliptic, 12 mm. long; stamens included. Pl. I, fig. 15: Apex of leaf x 1/2; fig. 16: Spike x 1/2; fig. 17: Flower x 1; fig. 18: Sepal x 1.

Type in the U. S. National Herbarium, No. 2,266,421, collected on a mountain near Loja, Province of Loja, Ecuador, altitude 2700 meters, in 1956, by H. Teuscher (No. 2017-56) and flowered in the Montréal Botanical Garden, May 1958.

GUZMANIA ASPLUNDII L. B. Smith, sp. nov.

A G. calamifolia André ex Mez, cui affinis, inflorescentia folias superante, scapi bracteis supremis internodia vix vel haud superantibus, bracteis florigeris sublaevibus lepidotis differt.

Stemless or short-caulescent, flowering 8-10 dm. high; leaves 6-8 dm. long; sheaths narrowly ovate, 10-15 cm. long, covered with appressed brownish scales, dark castaneous toward base, red-striate above; blades linear, acuminate, flat, 15 mm. wide, green, concolorous, obscurely lepidote; scape erect, slender, lepidote becoming glabrous; scape-bracts erect, lepidote, the lower foliaceous and densely imbricate, the upper lanceolate, caudate-acuminate, equaling or slightly exceeding the internodes; inflorescence laxly bipinnate from 5-12 spikes, 12-23 cm. long; axis straight or flexuous; primary bracts ovate, the lower ones acuminate and about half as long as the spikes, the upper apiculate and much shorter; spikes divergent to subspreading, very short-stipitate, strobilate, fusiform, acuminate, 5 cm. long, 1 cm. in diameter; floral bracts elliptic, obtuse, 18 mm. long, convex, ecarinate, subcoriaceous except for the brownish membranaceous margin, appressed-lepidote, pale green with a brown base; flowers subsessile; sepals oblong-obovate, acute, 14 mm. long, subequally short-connate; petals naked, pale green with brown margins (! Asplund); stamens included. Pl. I, fig. 19: Apex of leaf x 1/2; fig. 20: Spike x 1/2; fig. 21: Sepal x 1.

Type in the Naturhistoriska Riksmuseum, Stockholm, collected on rotten log in rastrojo, Mera, Province of Napo-Pastaza, Ecuador, altitude ca. 1050 meters, November 17, 1955, by E. Asplund (No. 18488).

ECUADOR: Napo-Pastaza: Forest near Mangayacu, Mera, alt. 1100 m., Dec. 6, 1955, Asplund 18704 (S). In rastrojo, Mera, alt. 1100 m., Feb. 16, 1956, Asplund 19408 (S).

GUZMANIA BIPARTITA L. B. Smith, sp. nov.

A G. cylindrica L. B. Smith, cujus spicam bracteasque valde imitans, inflorescentia biramosa, sepalis minoribus atrocastaneis lucidis differt.

Stemless (judging from the leaf), probably flowering well over 1 meter high; leaves 12 dm. long, densely appressed-lepidote on both sides; sheaths elliptic, ample, ca. 25 cm. long, dark castaneous toward base; blades ligulate, subacute with a thick terminal subulus, 65 mm. wide, flat, becoming glabrous with age; scape erect, at least 12 mm. in diameter, glabrous; scape-bracts erect, densely imbricate, the lower foliaceous, the upper lanceolate, acuminate, dark castaneous at base; inflorescence of two digitately arranged spikes; primary bract inconspicuous; spikes subsessile, strobilate, cylindric, 4 cm. in diameter, the lateral 18 cm. long, the terminal 27 cm.; floral bracts erect, about 8-ranked, suborbicular, 4 cm. long, somewhat striate and rugulose when dry, obscurely lepidote, red with a pale yellow apex; flowers subsessile; sepals oblong-obovate, obtuse, 22 mm. long, equally connate for 2 mm., dark castaneous, lustrous, the posterior ones obtusely carinate; petals and stamens unknown; capsules cylindric, shorter than the floral bracts; coma brown. Pl. II, fig. 1: Floral bract and calyx x 1; fig. 2: Sepal x 1.

Type in the Naturhistoriska Riksmuseum, Stockholm, collected on tree in forest, Vera Cruz, Province of Napo-Pastaza, Ecuador, altitude ca. 900 meters, February 18, 1956, by E. Asplund (No. 19474).

GUZMANIA SEPTATA L. B. Smith, sp. nov.

In systema Mezii G. compacta Mez proxima sed bracteis florigeris sepalisque acutis carinatisque differt, foliis et scapi bracteis irregulariter noduloso-septatis.

Stemless, flowering over 5 dm. high; leaves 3-4 dm. long, nodulose-septate in fine wavy cross-lines; sheaths oblong-elliptic, 13-18 cm. long, partially covered with fine brown appressed scales, dark castaneous at base, more or less red-striate above; blades ligulate, acute and subulate-apiculate, flat, 3 cm. wide, green, concolorous, glabrous; scape erect, 5 mm. in diameter; scape-bracts erect, densely imbricate, foliaceous, the upper much reduced but forming an involucre; inflorescence bipinnate, densely subglobose, 5 cm. long; primary bracts broadly ovate, the lower acuminate and covering the spikes, the upper apiculate and distinctly shorter than the spikes; spikes ellipsoid, strobilate, about 6-flowered, 25 mm. long; floral bracts broadly ovate, acute, carinate toward apex, 10-14 mm. long, equaled or slightly exceeded by the sepals at anthesis, coriaceous, even, punctulate near apex; flowers short-pedicellate; sepals elliptic, broadly acute, 13 mm. long, subequally connate for 5 mm., the lobes auricled at base, carinate at apex; petals white, naked, the blades elliptic, ca. 7 mm. long; stamens included; style exserted. Pl. II, fig. 3: Apex of leaf x 1; fig. 4: Inflorescence x 1/2: fig. 5: Sepal x 1.

Type in the Naturhistoriska Riksmuseum, Stockholm, collected on tree trunk, Mera, Province of Napo-Pastaza, Ecuador, altitude ca. 1100 meters, March 25, 1956, by E. Asplund (No. 19948).

ECUADOR: Napo-Pastaza: Shell Mera, alt. 900 m., March 10, 1956, Asplund 19679 (S).

GUZMANIA STRIATA L. B. Smith, sp. nov.

A G. hedychioides L. B. Smith, cui affinis, foliis caudato-acuminatis, scapi bracteis pulchre rubro-striatis, sepalis minoribus, petalis vix speciosis differt.

Stemless (judging from the leaves), flowering over 7 dm. high; leaves 8 dm. long;sheaths elliptic, 15 cm. long, appressed-lepidote, red-striate except for the castaneous base; blades linear, caudate-acuminate, 3 cm. wide at base, obscurely lepidote beneath; scape suberect, at least 7 mm. in diameter, glabrous; scape-bracts erect, imbricate, the lower subfoliaceous, the upper ovate, caudate-acuminate, strikingly red-striate; inflorescence bipinnate with 4 lateral spikes in the type, subdense, 14 cm. long; axis geniculate, rather stout, sulcate when dry; primary bracts ovate, apiculate, about half as long as the spikes, more or less striate toward apex; spikes strobilate, short-stipitate, the lateral divergent, ellipsoid, 5 cm. long, 15 mm. in diameter, the terminal cylindric, 9 cm. long, 20 mm. in diameter; floral bracts broadly elliptic, 2 cm. long, thin-coriaceous, sublustrous, faintly nerved toward apex, obscurely lepidote, red, dark-margined when dry; flowers subsessile; sepals narrowly obovate, acute , 17 mm. long, subequally short-connate, castaneous; petals 25 mm. long, pale yellow; stamens included. Pl. II, fig. 6: Spike x 1/2; fig. 7: Flower x 1; fig. 8: Sepal x 1.

Type in the Naturhistoriska Riksmuseum, Stockholm, collected on tree in forest on shore of Rio Pastaza, Shell Mera, Province of Napo-Pastaza, Ecuador, altitude ca. 900 meters, March 27, 1956, by E. Asplund (No. 19979).

PITCAIRNIA BRONGNIARTIANA André var. LATIFOLIA L. B. Smith, var. nov.

A var. brongniartiana laminis foliorum valde latioribus, minus acuminatis differt.

Leaf-blades oblanceolate, broadly acute and apiculate, 13.5-14.5 cm. wide.

Type in the Naturhistoriska Riksmuseum, Stockholm, collected on tree in forest, Mera, towards Puyo, Province of Napo-Pastaza, Ecuador, altitude ca. 1000 meters, November 17, 1955, by E. Asplund (No. 18474).

ECUADOR: Napo-Pastaza: Epiphyte in forest near Mangayacu, Mera, alt. 1100 m., Nov. 14, 1955, Asplund 18408 (S).

PITCAIRNIA OBLONGIFOLIA L. B. Smith, sp. nov.

P. straminea Poeppig ex Mez in systema Mezii proxima sed laminis foliorum oblongis subtus rufescente lepidotis, inflorescentia glabra, sepalis acutis majoribusque differt.

Apparently stemless (extreme base lacking), flowering nearly 5 dm. high; leaves few, the outer greatly reduced and scale-like, the inner to 3 dm. long; sheaths ovate, ca. 3 cm. long, spinose-serrate at apex; blades oblong, acute, cuneate but not petiolate, 3 cm. wide, entire, glabrous above, covered with minute rufescent scales beneath; scape erect, slender, glabrous; scape-bracts erect, lanceolate, the lowest imbricate and caudate-acuminate, the highest shorter than the internodes and apiculate; inflorescence simple, lax, 22 cm. long, glabrous; rhachis slender, slightly flexuous; floral bracts broadly ovate, apiculate, slightly shorter than the pedicels; flowers divergent, more or less secund; pedicels slender, 15 mm. long; sepals narrowly lanceolate, acuminate, 21 mm. long, ecarinate; petals over 35 mm. long, naked, red; stamens included (?); ovary over 4/5 superior; ovules long-caudate. Pl. II, fig. 9: Leaf x 1/4; fig. 10: Flower x 1;: fig. 11: Sepal x 1.

Type in the Naturhistoriska Riksmuseum, Stockholm, collected on cliff below Piñas, Province of El Oro, Ecuador, altitude 750 meters, March 20, 1955, by E. Asplund (No. 15850).

PITCAIRNIA VIOLASCENS L. B. Smith, sp. nov.

A P. aequatorialis L. B. Smith, cui affinis, scapi bracteis internodia superantibus, floribus pallide brunneo-violascentibus, sepalis minoribus differt.

Stemless, flowering nearly 7 dm. high; leaves polymorphic, the outermost with small suborbicular dark castaneous sheaths and short linear pectinate-serrate blades, grading upward into entire bladeless elliptic sheaths, the innermost leaves functional, to 45 cm. long; blades linear, caudate-acuminate, narrowed slightly toward base but not at all petiolate, 15 mm. wide, entire, obscurely channeled, glabrous above, sparsely white-flocculose beneath; scape erect, slender, glabrous; scape-bracts erect, exceeding the internodes but covering little of the scape, lanceolate, caudate-acuminate, green; inflorescence simple, lax, 26 cm. long, glabrous; rhachis slender, slightly flexuous; floral bracts lanceolate, acuminate, to 35 mm. long, exceeding all the pedicels, subchartaceous, violaceous; flowers suberect, light brownish violet; pedicels slender, 20 mm. long; sepals lance-oblong with a prominent mid-rib, acuminate, 27 mm. long; petals arching, to 85 mm. long, broadly acute, naked; stamens included, the anthers linear, 13 mm. long; ovary over 2/3 superior; ovules caudate. Pl. II, fig. 12: Flower x 1/2; fig. 13: Sepal x 1.

Type in the Naturhistoriska Riksmuseum, Stockholm, collected on steep rocky slope below village, Huigra, Province of Chimborazo, Ecuador, altitude 1000 meters, February 20, 1955, by E. Asplund (No. 15471).

PUYA ASPLUNDII L. B. Smith, sp. nov.

A P. gummifera Mez & Sodiro, cui affinis, tomento brunneo subpersistente, bracteis florigeris homomorphis erectis acutis, sepalis minime asymmetricis differt.

Flowering plant to 2 meters high; leaves 6 dm. long; sheaths suborbicular, 7 cm. wide, glabrous, dull; blades narrowly triangular, pungent, 4 cm. wide, flat, glabrous and green above, covered beneath with pale appressed scales, laxly serrate with curved antrorse or retrorse red-brown spines 7 mm. long; scape unknown; inflorescence subdensely bipinnate, except for the petals densely and rather persistently brown-lanate; primary bracts broadly ovate, apiculate, several times shorter than the branches, coriaceous, blackish brown and more or less rugose when dry, dull, entire; spikes subsessile, strobilate, subglobose or ellipsoid, the lateral ones 6-8 cm. long; floral bracts like the primary bracts but broadly acute, 25 mm. long, attaining about the mid-point of the sepals; pedicels stout, to 7 mm. long; sepals obovate, rounded and more or less retuse, 23 mm. long, like the bracts in texture and color; petals over 5 cm. long, obtuse, naked, green. Pl. II, fig. 14: Floral bract and flower x 1/2; fig. 15: Sepal (inside) x 1.

Type in the Naturhistoriska Riksmuseum, Stockholm, collected on rocky slope, Cuicocha, Province of Imbabura, Ecuador, altitude ca. 3150 meters, April 10, 1956, by E. Asplund (No. 20222).

The description of Puya gummifera makes no mention of the primary bracts, but material which agrees with it much better than P. asplundii has serrate primary bracts. Although there are slight differences in the form of the sepals I am tentatively including the following in P. asplundii:

ECUADOR: Pichincha: In a quebrada near "Cruz Verde," Firmin 412 (US). Azuay: Scattered on grassy hills of paramo, between Oña and Cuenca, alt. 2700-3300 m., Hitchcock 21646 (US). Azuay-Cañar: Between Cuenca and Huigra, alt. 2700-3000 m., Hitchcock 21675 (US).

TILLANDSIA ARGUTA L. B. Smith, sp. nov.

A T. pyramidata André, cui affinis, inflorescentia densa, spicis strictis, bracteis florigeris argute carinatis, sepalis anguste lanceolatis differt.

Stemless, flowering 12-15 dm. high; leaves 5-7 dm. long; sheaths large, broadly elliptic, tinged with dark purple; blades ligulate, acuminate, 6 cm. wide, flat, glaucous green with purple splotches, soon glabrous above, densely cinereous-lepidote beneath; scape erect; scape-bracts erect, densely imbricate and wholly covering the scape, the lower subfoliaceous, the upper lanceolate, red; inflorescence densely bipinnate, clavate or cylindric, glabrous except for the obscurely lepidote apices of the bracts, red except for the corollas; primary bracts ovate, acute, 5-6 cm. long; spikes linear, acute, strongly complanate, 9-29 cm. long with the larger ones higher, 2 cm. wide, densely many-flowered; floral bracts ovate, acute or acuminate, 25-35 mm. long, always exceeding the sepals, very sharply carinate, coriaceous, smooth, lustrous; pedicels 2 mm. long; sepals free, narrowly lanceolate, acute, 20-23 mm. long, the posterior ones sharply carinate; petals linear, 30 mm. long, naked, the blade lavender; stamens included, the filaments straight; capsule cylindric, about equaling the sepals. Pl. II, fig. 16: Spike x 1/2; fig. 17: Sepal x 1.

Type in the U. S. National Herbarium, Nos. 1,985,891 to

1,985,893, collected on tree in cloud forest at kilometer 50, between Cuenca and Oña, Province of Azuay, Ecuador, altitude 3900 meters, December 4, 1948, by M. B. Foster (No. 2619).

ECUADOR: Azuay: Gañadel, alt. 3050 m., November 23, 1955, E. Asplund 17713 (S). Azuay-Cañar: On tree, between Cuenca and Huigra, alt. 2700-3000 m., Sept. 12-13, 1923, A. S. Hitchcock 21676 (GH, NY, US).

TILLANDSIA ASPLUNDII L. B. Smith, sp. nov.

A T. delicatula L. B. Smith, cui affinis, inflorescentia bipinnata, sepalis subduplo majoribus bracteas florigeras ecarinatas distincte superantibus differt.

Stemless (judging from the broad leaves), flowering 75-95 cm. high; leaves 35-50 cm. long; sheaths broadly elliptic, 12-15 cm. long, very dark but covered with a glaucous coat of thin appressed whitish scales; blades ligulate, flat, broadly retuse and apiculate, 60-65 mm. wide, green and soon glabrous above, densely purple-spotted and subdensely pale-lepidote beneath; scape erect, slender, glabrous; scape-bracts strict, elliptic, all but the lowest imbricate, thin; inflorescence amply and laxly bipinnate, glabrous, red with yellow flowers; primary bracts lance-ovate, acute, to 5 cm. long, much shorter than the branches; branches subspreading, to 13 cm. long including the very short naked sterile base, lax, the rhachis slender, flexuous; floral bracts ovate, acute, 15 mm. long, always exceeded by the sepals, thin, prominently nerved, ecarinate; flowers spreading; pedicels slenderly obconic, 4 mm. long; sepals narrowly obovate, obtuse, 15 mm. long, equally short-connate, ecarinate; petals 20 mm. long; stamens included. Pl. II, fig. 18: Spike x 1/2; fig. 19: Sepal x 1.

Type in the Naturhistoriska Riksmuseum, Stockholm, collected in rastrojo near Alpayacu, Mera, Province of Napo-Pastaza, Ecuador, altitude 1050 meters, February 8, 1956, by E. Asplund (No. 19279).

ECUADOR: Napo-Pastaza: Epiphytic in rastrojo, Shell Mera, alt. 900 m., April 3, 1956, Asplund 20123 (S).

BOLIVIA and ARGENTINA

VRIESIA MAXONIANA (L. B. Smith) L. B. Smith, comb. nov.

Tillandsia maxoniana L. B. Smith, Contrib. Gray Herb. 124: 11, pl. 2, figs. 1-3. 1939; Lilloa 14: 99. 1948.

Vriesia icterica Castellanos, Lilloa 11: 150. 1945; Gen. & Sp. Pl. Argent. 3: 249, pl. 70. 1945.

BOLIVIA: La Paz: Nor Yungas: Subtropical region, Polo-Polo, near Coroico, alt. 1100 m., 1912, Buchtien 4538 (US, type; phot. GH). Santa Cruz: Florida: Mountain woods of Samaipata (Achiras), alt. 1500 m., Steinbach 8221 (GH).

ARGENTINA: Salta: Orán: Finca San Andres, Maromas, alt. 900 m., Aug. 1, 1944, Castellanos (LIL 110,320, type of Vriesia icterica Castellanos). Río Iruya, San José, Willink 325 (LIL). Yariguarenda, Las Piletas, Schulz 5105 (LIL).

Plate I

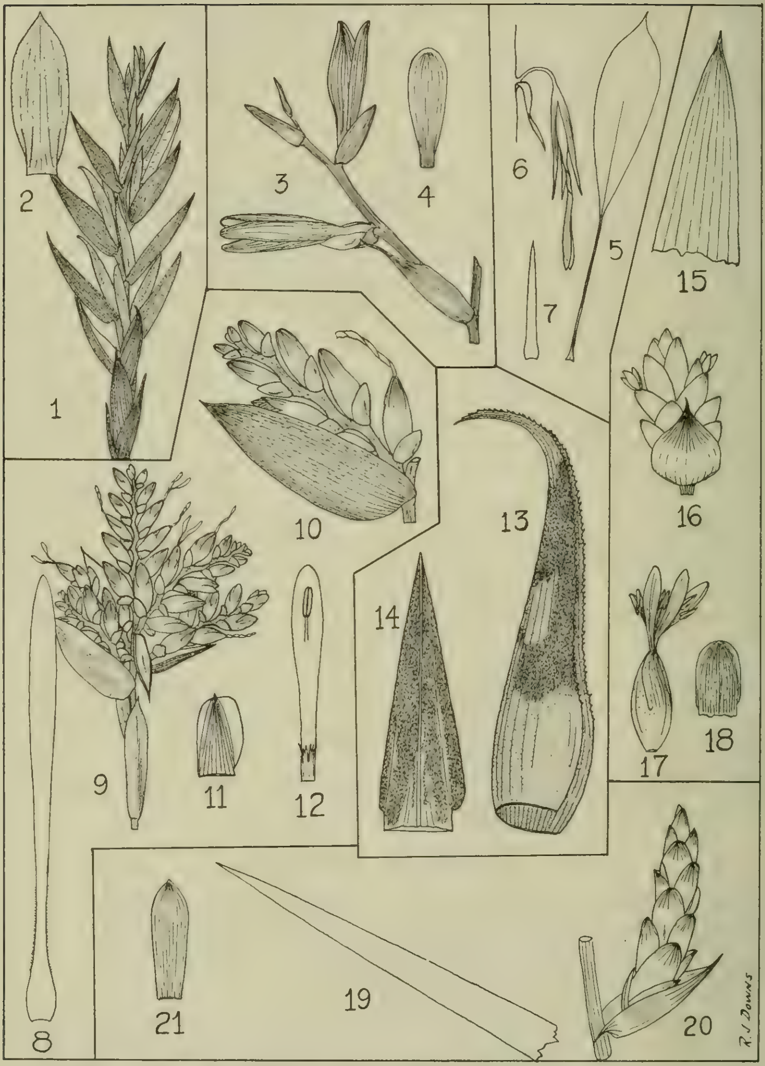

Fig. 1, 2: Tillandsia ariza-juliae; fig. 3, 4: Guzmania delicatula; fig. 5-7: Pitcairnia sneidernii; fig. 8-12: Aechmea abbreviata; fig. 13-14: Ae. strobilacea; fig. 15-18: Guzmania aequatorialis; fig. 19-21: G. asplundii.

Plate II

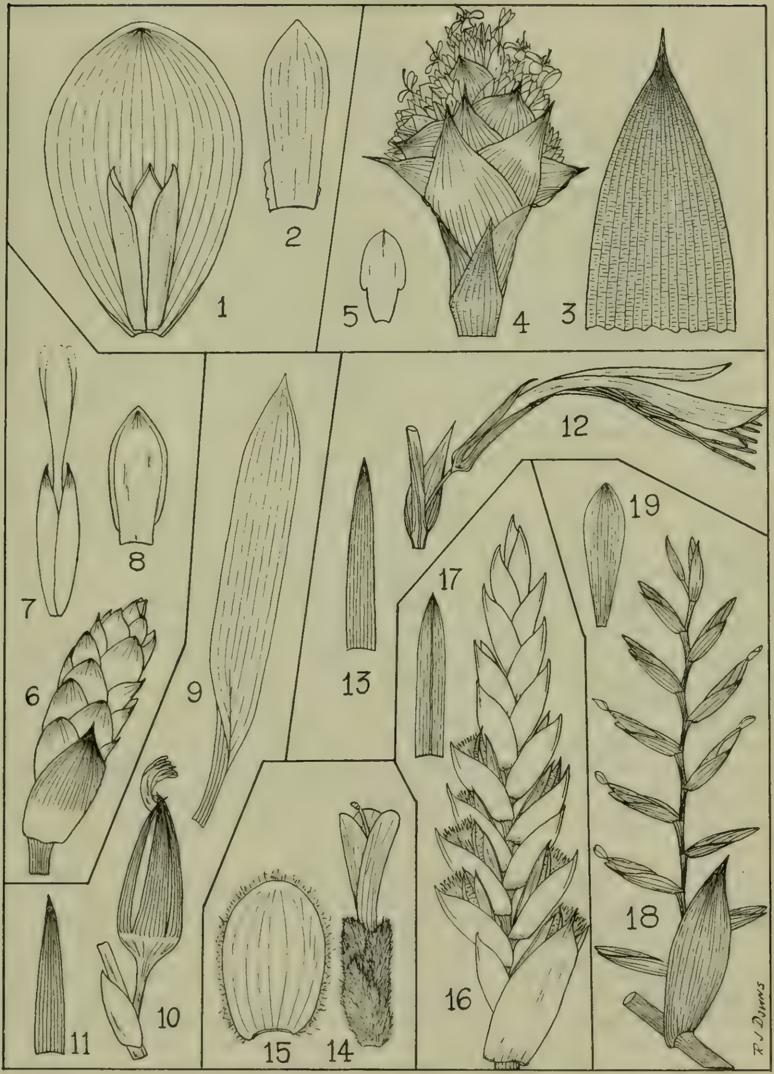

Fig. 1, 2: Guzmania bipartita; fig. 3-5: G. septata; fig. 6-8: G. striata; fig. 9-11: Pitcairnia oblongifolia; fig. 12, 13: P. violascens; fig. 14, 15: Puya asplundii; fig. 16, 17: Tillandsia arguta; fig. 18, 19: T. asplundii.

BOOK REVIEW

Otto Degener
Waialua, Oahu, Hawaii

"Hawaiian Flowers & Flowering Trees" is too exclusive a title for the 158-page book authored by Loraine E. Kuck and Richard C. Tongg. It tends to limit the book's reading to visitors and residents of tiny Hawaii alone. Of the 140-odd plants described and beautifully illustrated in color by Japanese artists, only five are strictly Hawaiian. The remainder are exotic, many to be found cultivated in gardens stretching from Bermuda and the islands of the Caribbean across Florida and Panama to California, Hawaii, the Philippines and spots in tropical Asia. Only a very few are found in gardens surrounding the Mediterranean.

Few books lack some typographical errors. Here we note the misspelling "Merr" for Merrill, "De Condolle" for deCandolle, "Willde" for Willdenow, "A. Grey" for A. Gray, "Benthan" for Bentham, and "Britt" for Britton.

The following changes in scientific names are recommended: *Scaevola frutescens* var. *sericea* should read *Scaevola sericea* var. *fauriei*; *Jacaranda ovalifolia*, *J. acutifolia*; *Clerodendron thomsonae*, *Clerodendrum thomsoniae*; *Pyrostegia ignea*, *P. venusta*; *Clerodendron fragrans* var. *pleniflorum*, *Clerodendrum* etc.; *Pseuderanthemum reticulatum* may well be *P. carruthersii*; *Vinca rosea* should read *Catharanthus roseus*; *Plumbago capensis*, *P. auriculata*; *Phaeomeria magnifica*, *Nicolaia elatior*; and the name *Thevetia nereifolia* should be deleted as obsolete because *T. peruviana* has priority by thirty-six years. Page 43 requires revision. The species figured is *Cordia subcordata*, the true *kou* of Polynesia; while *C. sebestena* is the *kou haole* or geigertree of tropical America. The genus *Cassia* is treated conservatively and not segregated into several genera on character of pods and other features.

"Hawaiian Flowers & Flowering Trees", priced at $7.50 and published by Charles E. Tuttle Company, Rutland, Vermont and Tokyo, Japan, in spite of shortcomings, is an ideal gift for myriads of northern garden lovers who escape the rigors of winter by following migratory birds to warmer climes. The book is distinctly not intended for the visitor interested in plants of the roadside and wide, open spaces. Only a local Flora can supply that need.

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BOOK REVIEW

Harold N. Moldenke

"Spring Flora of the Dallas - Fort Worth Area, Texas", by Lloyd H.

Shinners, 514 plus v pages; published by the author, Southern Methodist University, Box 473, Dallas 5, Texas. 1958. $6.15.

This is really an excellent guide to all of the over 1600 species of wild and cultivated flowering plants found within fifty miles of Dallas and Fort Worth, Texas, and blossoming from January to early June. Popularly written bifurcate keys are provided to families, genera, and species. The typography and format are exceptionally clear, resulting in a book easy to read by almost anyone. The eleven pages of line drawings of individual plants, and the map, are very useful. It is unfortunate that the added cost of doing so had precluded the inclusion of more drawings.

It is with distinct joy that this reviewer finds another manual that treats both the wild and the cultivated plants of an area! Unfortunately, so many of our professional botanists and writers of manuals regard cultivated plants as the pariahs of the vegetable kingdom -- the untouchables, not worthy of even being noticed and certainly under no circumstances to be dignified by inclusion in a local flora! Now we still await more local Floras that include not only the flowering plants and the vascular cryptogams, but also the non-vascular cryptogams, as far as they are known, of the region as well. Only then do we have a truly representative local Flora.

It is also with satisfaction that I note the acceptance of the families Agavaceae, Smilacaceae, and Hypoxidaceae.

Authors' surnames are given in full after each scientific binomial or trinomial, but, unfortunately, not after the names of higher categories. Linnaeus' name is the only one indicated by an abbreviation, "L."

There are, of course, a few typographic errors and other slips such as are found in all publications in their first edition. On page 60 Tribe 11 of the Grass Family is designated the "Tripsacaceae" -- this name being in the accepted form of family, not tribal, names. On page 152 a barberry hybrid is called Berberis "ottawaensis" in the key and B. "ottawensis" in the text description.

One of the most interesting and charming features of the book is the series of appendixes, apparently taken almost verbatim from some of the author's lectures to his students. Here are presented a review of the rules of nomenclature and pronunciation, a discussion of collecting techniques, a glossary of technical terms and explanation of abbreviations, a description of the phytogeography and ecology of the state, and fascinating bits of philosophic soliloquy on such subjects as the use of scientific names, the manufacture of common names, lumpers and splitters, conservation, etc. Features like this are needed in a technical manual to raise it to the rank of botanic literature.

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NOTES ON NEW AND NOTEWORTHY PLANTS. XXIII

Harold N. Moldenke

LIPPIA CIPOËNSIS Moldenke, sp. nov.

Frutex; caulibus ramisque griseis dense adpresso-strigosis sarmentosis, pilis albidis antrorsis; ramulis sarmentisque gracillimis dense albo-strigosis dense foliosis; foliis oppositis sessilibus tenuiter chartaceis ellipticis abrupte acutis integris utrinque dense breviterque pubescentibus subnitidis; inflorescentiis capitatis axillaribus versus apicem sarmentorum confertis dense multifloris 7 mm. latis dense albo-villosis.

Shrub; stems and branches slender, gray, densely appressed whitish-strigose with antrorse hairs, twiggy; branchlets and twigs very slender, densely white-strigose with appressed antrorse hairs and densely foliose; principal internodes about 1 mm. long, uniform; nodes not annulate; leaves decussate-opposite, dense, sessile; leaf-blades thin-chartaceous, uniformly bright-green on both surfaces or slightly lighter beneath, elliptic, 5--6 mm. long, 2--3.5 mm. wide, abruptly acute at the apex and base, entire, densely short-pubescent on both surfaces, somewhat glistening; midrib filiform, mostly indiscernible above, very slightly prominulous beneath; secondaries and veinlets indiscernible on both surfaces; inflorescence capitate, axillary, clustered near the apex of the twigs but not strictly terminal; peduncles very slender, about 3 mm. long, very densely white-strigose with appressed antrorse hairs; heads about 7 mm. wide, densely many-flowered, densely white-villosulous; involucral bractlets lanceolate, about 2 mm. long, almost 1 mm. wide at the base, subacute at the apex, densely white-villosulous; calyx about 2 mm. long, densely white-villosulous, the teeth erect, subulate; corolla hypocrateriform, its tube about 3 mm. long, the limb about 2 mm. wide, white-villosulous on the outside; fruit not seen.

The type of this very distinctive species was collected by Henrique Lahmeyer de Mello Barreto and Alexandre Curt Brade (no. 14444) at km. 142, Serra do Cipó, Minas Gerais, Brazil, on April 16, 1935, and is deposited in the herbarium of the Botanisches Museum at Berlin.

LIPPIA TROLLII Moldenke, sp. nov.

Frutex; ramis subgracilibus griseis valde tetragonis medullosis glabrescentibus; ramulis sarmentisque gracillimis tetragonis densissime breviterque pubescentibus plerumque aculeatis; foliis oppositis; petiolis brevissimis dense albo-pubescentibus; laminis tenuiter chartaceis ellipticis vel ovatis acutis vel subacutis regulariter serratis, supra sparse pubescentibus, pilis bulbosis, subtus densissime pubescentibus; inflorescentibus terminalibus racemosis.

Shrub; branches rather slender, gray, decidedly tetragonal, glabrescent, pithy; branchlets and twigs very slender, tetragonal,

very densely short-pubescent, often more or less aculeate with scattered thorns; nodes not annulate; principal internodes 1--2.5 cm. long; leaves decussate-opposite; petioles very short, usually 1--3 mm. long, densely white-pubescent; leaf-blades thin-chartaceous, rather dark-green above, much lighter beneath, elliptic or ovate, 2--3.8 cm. long, 1.1--2.1 cm. wide, acute or subacute at the apex and base, regularly serrate from near the base to the apex with appressed antrorse teeth, rather sparsely pubescent above with somewhat bulbous-based hairs, very densely pubescent beneath; midrib slender, plane or subimpressed above, prominulous beneath; secondaries filiform, 4--8 per side, ascending, not much arcuate, mostly terminating in the sinuses between the teeth, slightly impressed above, slightly prominulous beneath; veinlet reticulation indiscernible above, obscure or indiscernible beneath; inflorescence terminal, forming a simple or compound raceme 5--9 cm. long and 2--4 cm. wide; peduncles slender, tetragonal, about 2 cm. long, densely short-pubescent like the twigs; rachis slender, tetragonal, densely short-pubescent; bracts foliaceous, similar to the uppermost leaves but smaller, narrow-elliptic, 4--15 mm. long, 1--5 mm. wide, densely short-pubescent with whitish hairs, one pair at each node of the rachis; individual heads 2 or 3 per node, many-flowered, very dense, 7--9 mm. long, about 7 mm. wide, on very slender secondary peduncles 5--6 mm. long and densely whitish-villosulous; bractlets elliptic or elliptic-lanceolate, about 4 mm. long, 1.5--2 mm. wide, acute at the apex, usually more or less falcate and conduplicate, scattered-pilosulous with rather stiff whitish hairs, more densely so on the margins; calyx minute, densely villous; corolla hypocrateriform, its slender tube about 4 mm. long, the limb 2 mm. wide, glabrous on the outside, barbulate in the throat within; fruit not seen.

The type of this distinctive species was collected by Karl Troll (no. 1207) -- in whose honor it is named -- at Vallegrande, Santa Cruz, Bolivia, at an altitude of 1900 meters, on January 28, 1928, and is deposited in the herbarium of the Botanisches Museum at Berlin.

PHYLA NODIFLORA var. SUBSESSILIS (Bornm.) Moldenke, comb. nov.
Lippia nodiflora var. subsessilis Bornm., in sched.

As yet I have not been able to discover if Bornmüller ever published his trinomial elsewhere than on the labels of the type collection. However, the original labels are printed ones and were widely distributed to leading herbaria of the world. They bear a Latin description: "spicis capitato-abbreviatis in axillis subsessilibus". Therefore, in my estimation the publication is a valid one under the present edition of the International Rules. The type is Bornmüller 1239b, collected in Fruchtgärten, Jaffa, Palestine, growing in association with the normal form (no. 1239) of the species. Examples like this point up the urgent need of an index to subspecific scientific names in botanical literature corresponding to the INDEX KEWENSIS.

PYGMAEOPREMNA ANGUSTIFLORA (H. J. Lam) Moldenke, comb. nov.
Premna angustiflora H. J. Lam, Verbenac. Malay. Arch. 134--135. 1919.

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS *CITHAREXYLUM*. V

Harold N. Moldenke

CITHAREXYLUM LANKESTERI Moldenke

Additional literature: Brizicky, Stern, & Chambers, Trop. Woods 109: 78. 1958.

Calyx puberulent, the rim 5-apiculate, the apiculations more or less recurved; corolla hupocrateriform, its tube about 3.6 mm. long, about 1.8 mm. wide at the base, ampliate to 2.8 mm. at the apex, glabrous externally, densely tomentose in the throat within, the limb 5-parted, the lobes variable in size, subrotund-elliptic, about 2.8 mm. long and 2.6 mm. wide, rounded at the apex, pubescent; fertile stamens 4, subequal, not distinctly didynamous, inserted about 1 mm. below the mouth of the corolla-tube, equaling the corolla-tube; filaments about 0.7 mm. long; anthers oblong, about 1 mm. long and 0.5 mm. wide; staminode filiform, about 1 mm. long; pistil included; style about 1.5 mm. long, glabrous; stigma very shortly 2-lobed, the lobes about 0.3 mm. long; ovary obovate, about 1.5 mm. long, about 1.5 mm. wide at the apex, conspicuously 2-lobed and 2-sulcate, apparently 2-celled (or imperfectly 4-celled?); fruiting-calyx persisten on old rachids; fruit subglobose, fleshy, slightly flattened laterally, bright-yellow, borne in pendent racemes.

The type of this species was collected by Charles Herbert Lankester (*no. 243*) -- in whose honor it is named -- at Paso Ancho, at an altitude of 5500 feet, on Mount Irazú, in San José or Cartago, Costa Rica, in July, 1919, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. It has been confused with *C. rugendasii* Cham. [=*C. mocinni* D. Don], but its stellate-tomentose cinereous pubescence and pubescent corollas distinguish it from that species at once. It was found by Tucker on a bank above a stream on the north-facing side of a canyon, and it has been collected at altitudes of 1700 to 2150 meters, fruiting in June. It is said to be fairly common in occurrence at an altitude of 6300 feet on the slope of Volcán Barú near the town of Cerro Punto, Panama. In all, 7 herbarium specimens, including the type, and 4 mounted photographs have been examined.

Citations: EL SALVADOR: Chalatenango: *Tucker 1049* (N). COSTA RICA: Alajuela: *Ørsted 11192* (Cp). Cartago or San José: *Lankester 243* (B--photo of type, F--532255--isotype, K--type, K--isotype, N--isotype, N--photo of type, S--photo of type, Z--photo of type). PANAMA: Chiriquí: *Stern & Chambers 98* (Z).

CITHAREXYLUM LAURIFOLIUM Hayek in Engl., Bot. Jahrb. 42: 170 [as "Citharexylon"]. 1908; Prain, Ind. Kew. Suppl. 4: 49. 1913.

Literature: Hayek in Engl., Bot. Jahrb. 42: 170. 1908; Prain, Ind. Kew. Suppl. 4: 49. 1913; Moldenke, Geogr. Distrib. Avicenn. 23 & 28. 1939; Moldenke, Prelim. Alph. List Invalid Names 15. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34, 40, & 88. 1942; Moldenke, Alph. List Invalid Names 13. 1942; Moldenke, Alph. List Cit. 2: 328 & 447 (1948), 3: 690 & 705 (1949), and 4: 1067, 1112, & 1113. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 71, 96, & 179. 1949.

Shrub, about 1 m. tall, or tree; branches stout, stiff, woody, more or less tetragonal, gray, glabrous, with flaky bark; branchlets and twigs rather stout, stiff, light-brownish, glabrous, lenticellate, often many-ridged (and irregularly so); nodes annulate; principal internodes abbreviated, 0.5--4.8 cm. long; leaf-scars borne on stout, corky, ascending sterigmata 3--4 mm. long; leaves decussate-opposite, rather numerous on the branchlets and twigs only; petioles stout, 5--10 mm. long, glabrous, submargined, often nigrescent in drying; leaf-blades subcoriaceous, bright-green on both surfaces or slightly darker beneath, lanceolate-oblong or elliptic-oblong, 5.5--13 cm. long, 2.3--5.6 cm. wide, sharply acute at the apex, entire or minutely mucronulate-serrate above the middle, acute or cuneate at the base, apparently non-glanduliferous, glabrous and shiny on both surfaces; midrib slender, sharply prominulent above, prominent beneath; secondaries slender, 4--6 pairs, arcuate-ascending, sometimes not very much arcuate, anastomosing near the margins; vein and veiblet reticulation slender, abundant, prominulent on both surfaces; racemes terminal, simple, 6.5--23 cm. long, about 1.5 cm. wide, loosely many-flowered, the shorter ones often more densely-flowered, erect; peduncles stout, short, 7--22 mm. long, tetragonal, light-brown and very shiny, glabrous; rachis extremely stout, more or less tetragonal and many-ridged with often sharp and irregular ribs, light-brown, very shiny, glabrous; pedicels obsolete, but the flowers borne on short, stout, prominent sterigmata to which the rachis-ribs run; bracts and bractlets absent; prophylla not seen, apparently caducous; corolla greenish-white; fruiting-calyx very incrassate and indurated, coriaceous, cupuliform or campanulate, to 6 mm. long and 7 mm. wide, glabrous, shiny, its rim deeply lobed with 5 irregular lobes, or often 2-lipped almost to the base; fruit oblong or ovate, to 8 mm. long and 5 mm. wide, fleshy, glabrous, black in drying.

The type of this species was collected by August Weberbauer (no. 873) in shrubbery near a stream between Sandia and Cuyocuyo, at an altitude of between 2500 and 2600 meters, Puno, Peru, on May 1, 1902, and is deposited in the herbarium of the Botanisches Museum at Berlin. The flowers are often loosely disposed on the elongated rachis, especially on fruiting specimens; a considerable space often intervening between them. They are very irregularly disposed around the rachis or may simulate a close spiral. A ridge leads to each one, producing an irregularly many-ribbed rachis. This irregular arrangement of the flowers on the rachis is true of the entire genus, but it is less obvious when the racemes are more densely-flowered. The very stout and stiff rachis renders this species unmistakable, especially when taken in conjunction with its lauriform leaf-blades and sometimes mucronulate serrate margins. Normal pedicels are consistently absent in both flowering and fruiting specimens.

The species is said by Hayek to be closely related to *C. caudatum* L., but I feel, rather, that its relationship is with *C. reticulatum* H.B.K. of the same general area; in fact, it may well be conspecific with the latter. Brooke found it in a damp forest at a small gold mine in a narrow wooded valley, in dense forest and grass formation containing quantities of tree lupines, ferns, *Begonia larkei*, and tuberous *Fuchsia* species. It has been collected in flower in June and in fruit in May, at altitudes of 2500 to 3665 meters. In all, 22 herbarium specimens, including the type, and 9 mounted photographs have been examined.

Citations: PERU: Junín: *Weberbauer 6604* (F--629043, G, N, W--1497168). Puno: *Weberbauer 873* [Macbride photos 17594] (B--type, F--663023--photo of type, K--photo of type, Kr--photo of type, N--isotype, N--photo of type, N--photo of type, S--photo of type, Z--photo of type). BOLIVIA: La Paz: *W. M. A. Brooke 6485* (N); *Mandon 531* (Bm, Cb, Cb, G, K, N, N, N--photo, P, P, P, S, V, V--166967, V--166968, X, Z--photo).

CITHAREXYLUM LIGUSTRINUM Van Houtte, Cat. 205V: 32, nom. nud. [as"Citharexylon"]. 1883; Dippel, Hand. Laubholzk. 53. 1889.

Synonymy: *Ligustrum spicatum* Jacques, Rev. Hort. 339. 1863 [not *L. spicatum* Hort., 1877]. *Ligustrum multiflorum* Hort. ex Jacques, Rev. Hort. 339, in syn. 1863. *Ligustrum amurense* Hort. ex Decaisne, Fl. des Serres 22: 11, in syn. 1877 [not *L. amurense* Carr., 1861]. *Lippia ligustrifolia* G. Thuret ex Decaisne, Fl. des Serres 22: 11, hyponym. 1877. *Lippia ligustrina* G. Thuret ex Decaisne, Nouv. Arch. Mus. Paris, sér. 2, 2: 38, hyponym. 1879 [not *L. ligustrina* (Lag.) Britton, 1890, nor Lag., 1939, nor Kuntze, 1941, nor Nutt., 1942]. *Baillonia spicata* (Jacques) Baill., Bull. Soc. Linn. Paris 2: 880. 1890. *Citharexylon pringlei* Greenm., Proc. Amer. Acad. 41: 243—244. 1905. *Citharexylum pringlei* Greenm. apud Prain, Ind. Kew. Suppl. 3: 43. 1908. *Citharexylum spicatum* (Jacques) Sprague, Kew Bull. 1924: 146. 1924 [not *C. spicatum* Ryan, 1940, nor *Citharexylon spicatum* Rusby, 1900]. *Citharexylum bessonianum* Tod. ex Sprague, Kew Bull. 1924: 145—146, in syn. 1924. *Lippia japonica* Hort. ex Sprague, Kew Bull. 1924: 145, in syn. 1924. *Citharexylum ligustrinum* Thuret ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. *Baillonia spicata* Baill. ex Moldenke, Alph. List Invalid Names Suppl. 1: 2, in syn. 1947.

Literature: Jacques, Rev. Hort. 339. 1863; Decaisne, Fl. des Serres 22: 11. 1877; Decaisne, Nouv. Arch. Mus. Paris, sér. 2, 2:

38. 1879; Dippel, Handb. Laubholzk. 1: 53. 1889; Baill., Bull. Soc. Linn. Paris 2: 880. 1890; Jacks., Ind. Kew. 2: 80, 81, & 95. 1894; Durand & Jacks., Ind. Kew. Suppl. 1: 50. 1901; Greenm., Proc. Amer. Acad. 41: 243—244. 1905; Prain, Ind. Kew. Suppl. 3: 43. 1908; Sprague, Kew Bull. 1924: 145—146. 1924; Hill, Ind. Kew. Suppl. 7: 50. 1929; Moldenke, Geogr. Distrib. Avicenn. 13 & 36. 1939; Moldenke, Prelim. Alph. List Invalid Names 6, 15, 16, 30, & 31. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16, 71, & 88. 1942; Moldenke, Alph. List Invalid Names 6, 13—15, 29, & 31. 1942; Paray, Bol. Soc. Bot. Mex. 4: 12. 1946; Moldenke, Alph. List Cit. 1: 52, 153, 217, 272, & 306 (1946) and 2: 419, 424, 437, 447, 449, 562, 564, & 565. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 50 & 77. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29, 157, & 179. 1949; Moldenke, Alph. List Cit. 3: 713, 763, 764, 830, 831, 848, 873, & 895 (1949) and 4: 979, 998, 1028, & 1031. 1949.

Evergreen shrub or tree, to 5 m. tall; bark grayish or blackish-brown; old stems very rugose, the young ones smooth and very glabrous; branches and chanchlets slender, gray or brownish, lenticellate, obtusely or acutely tetragonal, glabrate, often roughened by the elevated lenticels; twigs very slender, numerous, brown, glabrous and very smooth; nodes somewhat flattened, annulate; principal internodes 1—5 cm. long; leaf-scars borne on erect or ascending sterigmata 1.5—4.5 mm. long, often very conspicuous; leaves decussate-opposite (or subopposite on young shoots); petioles slender, 2—5 mm. long, glabrous; leaf-blades firmly chartaceous, bright- or dark-green and very shiny on both surfaces or paler and glandular-punctate beneath with large circular glands scattered over the whole lamina, very glossy above, oblong or oblong-elliptic to elliptic-lanceolate, lanceolate, or ovate-lanceolate, often falcate and conduplicate in pressing, 2.5—8 cm. long, 1—3 cm. wide, acute or subacuminate to merely obtuse or short-acuminate and obtuse at the apex, entire or denticulate to sparingly subdentate or serrate with acute teeth above the middle, acute or cuneately attenuate at the base, not basally glanduliferous, completely glabrous on both surfaces; midrib slender, broad, flattened, not very prominulent on either surface; secondaries slender, numerous, close, 5—10 pairs, not at all prominulent on either surface, rather straight, arcuate and anastomosing at their apex near the margins; veins and veinlets obscure or even indiscernible; racemes terminal and terminating short axillary twigs, arcuate-recurved or nutant, numerous, 4—19 cm. long, 1—1.5 cm. wide, simple, densely many-flowered; peduncles slender, 1—2.2 cm. long, glabrous; rachis very slender or stoutish, glabrate; pedicels filiform, 1—2 mm. long, glabrate; bracts and bractlets absent; prophylla subulate or setaceous, 1—3 mm. long, glabrous; flowers more or less secund; calyx cupuliform, about 3 mm. long, 5-angled in cross-section, brownish or often purplish, slightly pubescent about the orifice on the inner surface, the rim sinuately 5-denticulate or subentire; corolla varying from white to pale-violet or lavender or bicolored, tubular-infundibular, about 4 mm. long, externally glabrous, densely pubescent or fimbriate in the throat, its tube yellowish or white, slightly surpassing the calyx, the limb 5-parted, 4--6 mm. wide, the lobes usually deep-purple or magenta to pale rose-violet, subrotund, scarcely over 1 mm. long and wide, spreading, slightly pubescent on the inner (upper) surface; fruiting-calyx and fruit not known.

The type of this interesting species has not been available to me for examination, but there seems to be no doubt at all that the various names given in its synonymy belong here. *C. pringlei* was based by Greenman on a collection made by Cyrus Guernsey Pringle (*no. 8932*) at Barranca, altitude 5000 feet, below the Trinidad Iron Works, Hidalgo, Mexico, on July 13, 1904, and is deposited in the Gray Herbarium of Harvard University. Dippel states that the binomial, *C. ligustrinum*, was proposed by Van Houtte in his "Catalogue for 1887", but a search through his catalogues no. 222, 223, 225, and 226, issued in 1887 and 1888, by Brenda E. Newton, Reference Librarian at the Massachusetts Horticultural Society, has failed to bring to light any mention of this name there.

The species has had a terrifically involved nomenclatural history, reviewed in part by Sprague in the reference cited above. It has been in cultivation for several generations in Europe under various names in the genera *Ligustrum* (*Oleaceae*), *Lippia*, *Baillonia*, and *Citharexylum*. Its earliest name appears to be *Ligustrum spicatum*, but the epithet "*spicatum*", is unavailable because it was used by Rusby in 1900 for an entirely different plant. In gardens the plant has much the appearance of a privet, and so the specific name here adopted for the species is singularly appropriate. Its original home was in doubt for a long time; W. W. Saunders in 1869 said it came "from the Himalayas"; in the Cambridge Botanic Garden, in 1903, it was thought to have come from Japan. Others have ascribed it to the Amur region, while the Index Kewensis Supplement 1 gives "Chili ?" as the original habitat. Jacques, who proposed the name *Ligustrum spicatum*, seems to be the only one who had the source of the material correct. He states that his nephew, M. Verdier, had obtained the seeds from Messrs. Vilmorin, who had, in turn, received them from Mexico.

The leaf-blades are extremely glossy above, often appearing as though varnished. Naudin's comment: "frutex....intense virens" is very true. Their privet-like appearance renders the species unmistakable in the genus. They are firm and completely glabrous and smooth, with the venation quite obscure. The *Strauss s.n.* at Berlin and one sheet of *Herb. Mus. Paris s.n.* at Paris have most of the leaves plainly dentate above the middle. Most of the authors who have described the plant also make mention of the leaves being occasionally dentate, so this seems to be a regular occurrence. Sprague says that as grown in England the plant is a comparatively small shrub which is usually not hardy unless it is grown in the protection of a wall. It appears to be widely cultivated in botanical gardens and on fine estates in Europe, usually under the name of C. bessonianum. It has been collected in anthesis in April and from June through September. Dr. M. T. Masters, in a letter to Hemsley, describes the plant as "an old garden plant".

In its native haunts it grows in thickets and barrancas, at altitudes of 1600 to 2000 meters. It has been confused in herbaria with C. caudatum L. Greenman points out that it is actually related to C. lucidum Schlecht. & Cham., but it is even more closely related and similar to C. fulgidum Moldenke, which may actually be conspecific.

In all, 61 herbarium specimens, including the types of most of the names involved, and 13 mounted photographs have been examined.

Citations: MEXICO: Hidalgo: H. E. Moore 5338 (N); Pringle 8932 (A, B, B--photo, Bm, Ca--139933, Cb, Cb, Cm, Cp, D--522687, E--119058, Ed, Ed, Ed, F--178605, G, Gg--155408, It, K, K--photo, L, Le, Me, Me, Me, Mu--4001, N, N, N--photo, Na--25812, Ol, P, Po--63795, S, S--photo, V--4739, Vt, W--461413, W--1159323, X, Z--photo), 15608 (G, Mi, S, Vt, W--1586656). Puebla: Aguirre & Reko 154 (N); K. Reiche 513 (Mu), 712 (Mu); A. J. Sharp 441230 (N). Sinaloa: Rose, Standley, & Rose 14785 (E--894705). CULTIVATED: England: Herb. Bot. Gard. Cambridge s.n. [H/149/1924] (K); Herb. Hort. Cantab. s.n. [25 July 1903] (K); Masters s.n. [Sept. 16, 1895] (K); Saunders s.n. [Cult. Torquay] (K, N--photo, Z--photo). France: Decaisne 5 (P); Gadeceau 5694 (Bm); Herb. Hort. Huber 782 (M), B.131 (M); Herb. Mus. Paris s.n. [Hort. Bot. Parisiensis 1875] (P), s.n. (P, P); Naudin s.n. [Villa Thuret, 18 juin 1889] (A, N--photo, Z--photo). Germany: Strauss s.n. [Hort. Bot. Dahlem] (B, N--photo, Z--photo). Italy: Todaro s.n. [h. Bot. Palermo, Aug. 6, 1878] (K, N--photo, Z--photo).

CITHAREXYLUM LONGIFLORUM Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 207--208. 1863.

Synonymy: Citarexylum longiflorum Turcz. ex Alain in León & Alain, Fl. Cuba 4: 301, sphalm. 1957.

Literature: Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 207--208. 1863; Jacks., Ind. Kew. 1: 549. 1893; O. E. Schulz in Urb., Symb. Antill. 6: 68--69. 1909; Moldenke, Geogr. Distrib. Avicenn. 5. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 24 & 88 (1942) and [ed. 2], 43 & 179. 1949; Alain in León & Alain, Fl. Cuba 4: 299 & 301. 1957.

Stems tetragonal, tuberculate, glabrous or lightly puberulent toward the apex; leaves opposite or sometimes approximate; petioles short; leaf-blades lanceolate, abruptly short-acuminate at the apex, entire and revolute-margined, somewhat attenuate at the base, green and glabrous above, paler and lightly puberulent along the veins beneath; inflorescence paniculate, terminal, subequaling the leaves; flowers pedicellate, nutant; calyx campanulate, nigrescent at the base, hirtellous, its rim very shortly 5-dentate; corolla tubular-infundibular, externally puberulent, glabrous within, its tube 4--5 times as long as the calyx; stamens inserted in the lower part of the corolla-tube, in a whorl, in two unequal pairs; filaments dilated at the base, twice as long as the anthers; anthers elliptic, dorsifixed, included; style filiform, as long as the stamens, not thickened at the apex.

The type of this little-known species was collected by Ramón de la Sagra (no. 50) somewhere in Cuba. The species is known thus far only from the type collection, and no material of it has been available to me for examination, nor was any seen by Schulz, who monographed the West Indian members of the genus in 1909, nor by Alain, who wrote up the genus in the latest Cuban flora. Turczaninow notes that the length of its corollas and filaments causes it to differ from all other members of the genus known to him. I suspect that it may be a species of Clerodendrum.

Citations: MOUNTED CLIPPINGS: Urb., Symb. Antill. 6: 68--69. 1909 (S).

CITHAREXYLUM LUCIDUM Schlecht. & Cham., Linnaea 5: 97. 1830 [not C. lucidum D. Don, 1831, nor Griseb., 1909].

Synonymy: Citharexylon lucidum Cham. & Schlecht. ex Mart. & Gal., Enum. 16: 12. 1844. Citharexylon chamissonis Walp., Repert. 4: 75--76. 1845. Citharexylon lucidum Cham. apud Walp., Repert. 4: 76, in syn. 1845. Citharexylum lucidum Cham. ex Schau. in A. DC., Prodr. 11: 612, in syn. 1847. Citharexylum chamissonis Walp. apud Schau. in A. DC., Prodr. 11: 612, in syn. 1847. Citharexylum lucidum Cham. & Schlecht. apud Jacks., Ind. Kew. 1: 550, in syn. 1893. Citharexylum odoratissimum Schiede & Deppe ex Moldenke, Prelim. Alph. List Invalid Names 17, in syn. 1940 [not C. odoratissimum Ørst., 1940]. Citharexylum lucidum C. DC. ex Moldenke, Alph. List Invalid Names 58, in syn. 1942.

Literature: Schlecht. & Cham., Linnaea 5: 97. 1830; Walp., Repert. 4: 75--76. 1845; Schau. in A. DC., Prodr. 11: 612. 1847; Jacks., Ind. Kew. 1: 549 & 550. 1893; O. E. Schulz in Urb., Symb. Antill. 6: 58. 1909; Roig, Bol. Est. Exp. Agron. Santiago Vegas 54: 793. 1928; Moldenke, Alph. List Common Names 22 & 30. 1939; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Prelim. Alph. List Invalid Names 16 & 17. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Invalid Names 14, 15, & 58. 1942; Moldenke, Phytologia 2: 97. 1944; Roig, Plant. Med. Cuba 533. 1945; Moldenke, Alph. List Cit. 1: 50, 53, 118, 192, 218, 312, & 314. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 5. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 53. 1948; Moldenke, Alph. List Cit. 2: 332, 341, 347, 419, 422, 499, 500, & 502 (1948), 3: 659, 663, 695, 834, 835, 900, & 901 (1949), and 4: 1038, 1055, & 1066. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949; Roig, Dicc. Bot. 2: 1003. 1953.

Shrub or tree, to 8 m. tall; branches and branchlets medium-stout, obtusely or acutely tetragonal, brown, glabrous; twigs mostly more slender and more acutely tetragonal, more or less striate-ribbed, glabrous; nodes annulate; principal internodes 4-6.5 cm. long; leaf-scars borne on stout, corky, ascending, closely appressed, glabrous sterigmata to 7 mm. long and mostly very conspicuous; leaves decussate-opposite; petioles stout, 6--12 mm. long, subterete or slightly canaliculate at the apex above, glabrous, dark; leaf-blades firmly chartaceous [not "coriaceous" as stated by Walpers], very dark-green above, lighter beneath, very shiny and glossy above, ovate-elliptic or elliptic to lanceolate, 10.7--19 cm. long, 4.7--7.6 cm. wide, acute or very shortly acuminate and mucronate at the apex, entire, acute or subcuneate to cuneate at the base, bearing a pair of small glands alongside the midrib at the very base, perfectly glabrous on both surfaces or pulverulent-punctate; midrib rather stout, especially at the base, very prominent beneath; secondaries slender, 6--10 pairs, arcuate-ascending, usually not much arcuate and not anastomosing, plane above, prominulent beneath; vein and veinlet reticulation fine, rather abundant, prominulent beneath; racemes axillary and terminal, mostly terminal, erect or nutant, 5.5--15 cm. long, to 2.8 cm. wide (in fruit), many-flowered, simple or branched; peduncles slender or stoutish, 1.5--2 cm. long, glabrous; rachis slender or stoutish, glabrate; pedicels slender, about 1 mm. long, glabrate, in fruit incrassate and to 3 mm. long; bracts and bractlets absent; prophylla setaceous, to 1 mm. long, often not obvious; flowers fragrant; corolla white; fruiting-calyx shallowly cupuliform or patelliform, to 4 mm. long and 8 mm. wide, glabrous, its rim entire or irregularly and rather shallowly lobed with rounded or truncate lobes; fruit oblong, to 12 mm. long and 11 mm. wide, fleshy, very smooth and shiny, 2-lobed, 2-sulcate, black in drying.

The type of this species was collected by Christian Julius Wilhelm Schiede (no. 128) in woods at Hacienda de la Laguna, Jalapa, Vera Cruz, Mexico, and is deposited in the herbarium of the Botanisches Museum at Berlin. The species has been amazingly misunderstood in the past. In the first place, Walpers, in 1845, gave it a new name, C. chamissonis, because its name is a homonym of C. lucidum D. Don. However, Don's name was published in 1831, while that of Schlechtendal and Chamisso appeared in 1830, so it is the Don name which must be abandoned. Then Schauer, in 1847, for some reason not clear to me, reduced C. chamissonis to C. caudatum L. In this he was followed by Jackson in the "Index Kewensis" in 1893, and by Schulz in 1909. "C. lucidum Cham. & Schlecht." was also reduced to C. caudatum by Jackson in 1893 and by Roig in 1933, while Schulz, in 1909, reduced "C. lucidum Cham." to C. caudatum. Actually all these names are based on the same Schiede 128 type from Jalapa and have nothing whatever to do with the West Indian C. caudatum. On the other hand, the "C. lucidum, Cham., Schlecht.!" of Griseb., Fl. Brit. W. Ind. 497 (1861) actually is C. caudatum insofar as the plant described is concerned, although some of the synonyms cited belong to C. spinosum L. It is this error by Grisebach which probably misled Jackson, Schulz, and Roig.

Martens and Galeotti's Enumeration reprint is cited as "16: 12" in literature, but the copy in the library of the New York Botanical Garden has no part numbers printed on the title-pages of the various separately paged parts, but the part in which our reference occurs is marked "[xv]" in pencil. Whether it was actually the 15th or the 16th part of the reprinted work is not certain.

The species appears to inhabit woods, ascending to 1450 meters altitude, and has been collected in flower in January and from September through November, and in fruit in January, February, October, and November. The immature leaves are more membranous in texture and are dull and nigrescent in drying. Common names recorded for the plant are "naranjillo" and "tepesi". Herbarium material has been confused with *C. caudatum* and with *C. donnell-smithii* Greenm., both of which species it resembles in general aspect. In all, 54 herbarium specimens, including the types of all the names involved, and 7 mounted photographs have been examined.

Citations: MEXICO: Vera Cruz: *Bonpland 4437* (P); *Botteri s.n.* [Orizaba] (P); *Endlich 1159* (B), *1509* (B); *Galeotti 7051* (Br, Br, Cb, K, P); *Liebmann 11363* (Cp, F—689250), *11364* (Cp, F—689258, N), *11365* (Cp, F—689263), *15486* (Ca—424377, Cp, F—689264, W—1492785); *Linden 32* (Br, Cb, K); *Purpus 3708* (B, Bm, Ca—139936, Cb, Cb, E—119054, Ed, Ed, F—276458, G, N, P, P, W—841240), *6141* (Bm, Ca—168094, E—705173, F—386652), *s.n.* [Zacuapan, 1907] (Ca—139937); *Sartorius s.n.* (B); *Schiede 128* [Macbride photos 34316] (B—isotype, F—871563—isotype, F—976254—photo of isotype, G—isotype, K—photo of isotype, Kr—photo of isotype, L—isotype, N—photo of isotype, N—photo of isotype, S—photo of isotype, V—isotype, Z—photo of isotype), *s.n.* [Jalappa] (L); *Schiede & Deppe s.n.* [prope Jalapa] (Bm, L). State undetermined: *Liebmann 11191* (Cp, W—1315037). LOCALITY OF COLLECTION UNDETERMINED: *Collector undesignated s.n.* (Dr).

CITHAREXYLUM LYCIOIDES D. Don, Edinb. New Philos. Journ. 11 [Jan.—Mar.]: 237—238. 1831.

Synonymy: *Citharexylon lycioides* D. Don apud Walp., Repert. 4: 77. 1845. *Citharexylum pauciflorum* T. S. Brandeg., Zoe 5: 236. 1906.

Literature: D. Don, Edinb. New Philos. Journ. 11 [Jan.—Mar.]: 237—238. 1831; Walp., Repert. 4: 77. 1845; Schau. in A. DC., Prodr. 11: 614. 1847; Jacks., Ind. Kew. 1: 550. 1893; T. S. Brandeg., Zoe 5: 236. 1906; Prain, Ind. Kew. Suppl. 4: 49. 1913; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Prelim. Alph. List Invalid Names 17. 1940; Moldenke, Suppl. List Invalid Names 11. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Invalid Names 15. 1942; Moldenke, Alph. List Cit. 1: 252 & 307 (1946), 2: 339, 419, & 499 (1948), and 3: 833 & 926. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949.

Unarmed virgate shrub; branches dark-chestnut; branchlets slender, blackish, acutely or obtusely tetragonal, glabrous; twigs numerous, short, very slender, gray or grayish-white, usually acutely tetragonal, often striate, glabrous; nodes rather obscurely annulate; principal internodes usually abbreviated, 6--34 mm. long; leaf-scars borne on comparatively stout prominent sterigmata to 3.5 mm. long; leaves numerous, decussate-opposite, often rather crowded, sessile; petioles obsolete; leaf-blades chartaceous, rather uniformly green on both surfaces, linear-lanceolate or linear-oblanceolate to very narrowly elliptic-spatulate or even oblong-ovate, 1--4 cm. long, 3--7 mm. wide, acute or acuminate to obtuse at the apex, entire and slightly revolute along the margins, long-cuneate and attenuate at the base, not basally glanduliferous, glabrous on both surfaces, densely impressed-punctate beneath; midrib very slender, slightly prominulous beneath; secondaries very obscure; vein and veinlet reticulation indiscernible; racemes axillary [and subterminal ?], 1- or 2-flowered, opposite, about 5 mm. long, usually 1--3-leaved; peduncles and rachis none; pedicels very slender, about 4 mm. long, gray, glabrous, jointed at the middle, in fruit to 7 mm. long; bracts, bractlets, and prophylla absent; calyx about 2 mm. long, its rim subtruncate and entire, slightly fimbriate; corolla tubular, dull-white, about 3 mm. long, pubescent in the throat, the lobes oblong, rounded at the apex; stamens 4 or 5; fruiting-calyx indurated, cupuliform, 2.5--3 mm. long, 4.5--5 mm. wide, not ribbed, glabrous, its rim truncate and entire or sometimes eventually shallowly and very irregularly lobed or split; fruit oblong, about 6 mm. long and 5 mm. wide, red or black, somewhat fleshy, glabrous, shiny, becoming wrinkled and 2-sulcate in drying.

The type of this very distinctive species was collected by Martín Sessé y Lacasta, José Mariano Mociño, Juan Diego del Castillo, and José Maldonado (no. 2364) somewhere in Mexico, and is deposited in the herbarium of the Jardin Botanico at Madrid. The type of C. pauciflorum was gathered by Carl Albert Purpus (no. 1449) on mountain slopes at Ixmiquilpan, Hidalgo, Mexico, in July, 1905, and is deposited in the herbarium of the University of California at Berkeley.

The species has a very decided appearance of the genus Lycium in the Solanaceae. The leaves at first glance appear to be petiolate, with very slender margined petioles 1--4 mm. long, but on closer examination a petiole cannot be distinguished. It is possible that the fruit on Purpus 1449 is still immature, because the base of the style still persists. The "Index Kewensis" dates the Zoe reference to "1907", but the first page of Brandegee's article has "issued September 16, 1906" plainly printed at the bottom.

Dr. Greenman on February 27, 1907, on a sheet of Purpus 1449 in the herbarium of the Chicago Natural History Museum, first suggested that C. pauciflorum might be conspecific with Don's species, although Brandegee considered the two to be distinct. In all, 12 herbarium specimens, including the types of all the names involved, and 13 mounted photographs have been examined.

Citations: MEXICO: Hidalgo: Purpus 1449 (B—photo, Ca—139934, E—119057, E—photo, F—192987, G, K, N, N, N—photo, N—photo, S—photo, S—photo, W—1208196, W—photo, Z—photo, Z—photo). Vera Cruz: Hahn 90 (N—photo, P, Z—photo). State undetermined: Sessé, Mociño, Castillo, & Maldonado 2364 (F—851477—isotype, N—isotype, N—photo of type, Q—type, Z—photo of type).

CITHAREXYLUM MACRADENIUM Greenm. in Donn. Sm., Enum. Pl. Guatem. 7: 70, hyponym. 1905; Field Columb. Mus. Publ. Bot. 2: 188—189. 1907.

Synonymy: Citharexylum caudatum Donn. Sm. apud Greenm., Field Columb. Mus. Publ. Bot. 2: 189, in syn. (in part). 1907 [not C. caudatum L., 1770, nor Sw., 1847, nor Sagra, 1909]. Citharexylum macradenium Greene ex Moldenke, Alph. List Invalid Names Suppl. 1: 5, in syn. 1947. Cytharexylum macradenium Greenm., in herb.

Literature: Greenm. in Donn. Sm., Enum. Pl. Guatem. 7: 70. 1905; Greenm., Field Columb. Mus. Publ. Bot. 2: 188—189. 1907; Prain, Ind. Kew. Suppl. 3: 43 (1908) and 4:49. 1913; Standl., Field Mus. Publ. Bot. 18: 1001. 1938; Moldenke, Geogr. Distrib. Avicenn. 17. 1939; Moldenke, Alph. List Common Names 10. 1939; Moldenke, Alph. List Invalid Names 58. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 22 & 88. 1942; Moldenke, Bot. Gaz. 102: 161. 1944; Moldenke, Phytologia 2: 97. 1944; Moldenke, Alph. List Cit. 1: 58 & 301. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 5. 1947; Moldenke, Alph. List Cit. 2: 339—341, 344, 346, 389, 390, 436, 447, & 465 (1948), 3: 817, 940, 944, & 945 (1949), and 4: 999, 1000, 1057, 1082, & 1087. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 39, 40, & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949.

Tree, to 18 m. tall, the crown rounded; trunk to 25 cm. in diameter at the base; bark gray, roughened by raised oblong strips or pieces; branchlets medium, acutely tetragonal, more or less 4-margined, light-gray, glabrous; twigs and young shoots slender, more or less acutely tetragonal, nigrescent in drying, glabrous, shiny; nodes annulate; principal internodes 1.8—5 cm. long; leaf-scars borne on short ascending sterigmata 1—3 mm. long; leaves decussate-opposite (or subopposite on vigorous shoots), very easily detached from the stem; petioles slender, 1.1—2.7 cm. long, subterete or sulcate above, glabrous, nigrescent in drying; leaf-blades firmly chartaceous, rather bright-green on both surfaces, brunnescent or nigrescent in drying, lanceolate or narrowly oblong or elliptic, 7—16.5 cm. long, 1.7—4.2 cm. wide, acute or short-acuminate at the apex (the apex itself obtuse, apiculate, or retuse), entire, cuneately narrowed at the base, often infundibularly involute into the petiole and bearing 1—3 (mostly 2) extremely large, thick, black glands to 4 mm. long just above the base, one of which often is terminated by a light discoid stigma-like body, glabrous and densely impressed-punctate on both surfaces, but not shiny; midrib slender, sharply prominulent (except at the base) above, prominent beneath; secondaries slender, 6 or 7 pairs, arcuate-ascending, more or less prominulent on both surfaces, anastomosing near the margins; vein and veinlet reticulation sparse, mostly obscure; racemes terminal, simple or compound with a pair of lateral branches near the base, the central one 8.5—19.5 cm. long, 1—1.5 cm. wide, densely many-flowered, mostly erect, sometimes recurved; peduncles rather stoutish, 2—2.5 cm. long, acutely tetragonal, glabrous, often with 1 or 2 bractlet-bearing nodes; rachis slender or stoutish, angled or ribbed, glabrous; pedicels slender, 1—1.5 mm. long, glabrous, in fruit elongating to 5 mm.; bracts and bractlets caducous; prophylla setaceous, about 1 mm. long; calyx cupuliform, about 2.5 mm. long, 5-angled in cross-section, its rim subtruncate, minutely 5-denticulate; corolla white, tubular-infundibular, its tube about 4 mm. long, externally essentially glabrous, pubescent in the throat, the lobes oblong, about 2 mm. long, puberulent on both surfaces; stamens included; style puberulent; fruiting-calyx subpatelliform, about 2.5 mm. long and 6 mm. wide, 5-ribbed, glabrous, its rim irregularly and shallowly erose; fruit subglobose or round, 6—10 mm. long and wide, lustrous, fleshy when mature, bony when immature, orange or orange-yellow, 2-sulcate, glabrous.

The type of this species was collected by Adolfe Tonduz (*no. 7407*) at Pâturaga de la Palma, San José, Costa Rica, at an altitude of 1459 meters, on August 25, 1898, and is deposited in the Gray Herbarium of Harvard University. Specimens have been confused in herbaria with *C. caudatum* L. and *C. donnell-smithii* Greenm., both of which are very similar, and with *Cytharexylum villosum* Jacq. [=*Citharexylum fruticosum* var. *villosum* (Jacq.) O. E. Schulz], which is totally dissimilar! Common names reported are "dama", "damas", and "danna". The first of these is also applied to *C. caudatum* and *C. donnell-smithii*, and the second to *C. donnell-smithii*.

The species inhabits forests and cloud-forests, in rich clay-loam soil, in semi-shade, and in open shade at the forested edges of barrancas, from 380 to 2043 meters altitude. Standley states that it is commonest between 1100 and 2000 meters. Smith says: "our commonest tree.......fruits in great favor with wild pigeons". It has been collected in anthesis in January, February, and August, and in fruit in March and May. In all, 35 herbarium specimens, including the types of all the names involved, and 5 mounted photographs have been examined.

Citations: COSTA RICA: Alajuela: *Brenes 4363* [9540 (148)] (F-852233, N), *16195* (F--857521, N), *16195a* (N), *17162* (F--859614, N); *Skutch 3721* (N, S); *A. Smith 168* (F—918661, N), *H.90* (F—941344). Heredia: *H. Pittier 2132* (N, W--1323215); *Tonduz 2132* (Br, Mu--3787, W--1323214). San José: *Tonduz 2182* (P), *7407* [Herb. Instit. Physico-geogr. Nat. Costaric. 12502] (B—isotype, B—isotype, B--photo of type, Bm--isotype, C--isotype, F—76908--isotype, G—type, K--isotype, K--isotype, K—photo of type, Mu—

3826--isotype, N--photo of type, S--photo of type, W--355514--isotype, W--1323213--isotype, X--isotype, X--isotype, Z--photo of type), s.n. [Herb. Instit. Physico-geogr. Nat. Costaric. 11646; Herb. Pittier 11646] (Cm, V--10966); M. Valerio 31 (F--873055). PANAMA: Coclé: P. H. Allen 2784 (N).

CITHAREXYLUM MACROCHLAMYS Pittier, Contrib. U. S. Nat. Herb. 18: 254. 1917.

Synonymy: Citharexylum macranthum Pittier, Contrib. U. S. Nat. Herb. 18: 169. 1916 [not Citharexylon macranthum Hayek, 1908].

Literature: Hayek in Engl., Bot. Jahrb. 42: 170. 1908; Pittier, Contrib. U. S. Nat. Herb. 18: 169 (1916) and 254. 1917; Hill, Ind. Kew. Suppl. 6: 47. 1926; Moldenke, Geogr. Distrib. Avicenn. 17. 1939; Moldenke, Prelim. Alph. List Invalid Names 16. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 23 & 88. 1942; Moldenke, Alph. List Invalid Names 14. 1942; Moldenke, Bot. Gaz. 102: 161. 1944; Moldenke, Castanea 10: 41. 1945; Moldenke, Alph. List Cit. 1: 134 (1946), 3: 818 (1949), and 4: 1034 & 1076. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 40, 59, & 179. 1949.

Tree, to 30 m. tall; trunk to 50 cm. in diameter at the base, straight, covered with a reddish rugose bark, the core dirty-yellow; wood hard and tough; crown elongate; limbs slightly ascending; branchlets and twigs stout, more or less fistulose, acutely tetragonal or 6-angled, very slightly 4--6-margined, light-brown, glabrous; nodes annulate; principal internodes 4.5--7.5 cm. long; leaf-scars tremendously large, oblong, about 5 mm. long and 3 mm. wide, sessile or borne on extremely short sterigmata, most prominent at the base; leaves usually alternate, ternate at the ends of the young floriferous shoots; petioles slender or stout, 1.5--3.7 cm. long, more or less broadly sulcate above, greatly ampliate in the form of a shield at the base, densely but very minutely puberulent or glabrate; leaf-blades thin-chartaceous or membranous, bright-green on both surfaces, whitish beneath when immature, elliptic-oblong or elliptic to ovate or subobovate, often undate in drying, 9.8--25 cm. long, 5.5--9.2 cm. wide, acute or subacute to acuminate or rounded at the apex, entire, often undulate along the margins in drying, varying from subtruncate to acute or rounded-attenuate or even cuneate at the base, bearing 2 or 3 very large, thickened, black glands at the very base beneath and parallel to the petiole, obsoletely and very minutely puberulent on both surfaces, especially beneath, or entirely glabrous, smooth to the touch above, finely reticulate-roughened between the salient veins beneath; midrib stoutish, plane or more or less prominulent above, prominent beneath; secondaries slender, 10--15 pairs, close, arcuate-ascending, plane above, prominulent beneath, hardly at all or merely obscurely anastomosing at the margins; vein and veinlet reticulation extremely fine and abundant, obscure or more or less prominulent above, conspicuous to the last detail (but usually not at all prominulent except for the larger ones) beneath; inflorescence subterminal, the racemes axillary, usually ternate, simple, mostly erect or ascending, on the 2 or 3 upper nodes of the branchlets, 13--28 cm. long, 1--2 cm. wide, loosely many-flowered; peduncles slender or stout, 4--7.5 cm. long, minutely puberulent or glabrate; rachis slender or stoutish, glabrous to minutely hirsute or puberulous; pedicels slender, 0.5--1.5 mm. long, puberulent or minutely hirtellous; bracts and bractlets absent; prophylla setaceous, about 1 mm. long; flowers distinctly zygomorphic, large for the genus, about 17 mm. long; calyx hypocrateriform, about 5 mm. long, subglabrous or finely pubescent, its rim irregularly 5-dentate; corolla white, 15.5--17 mm. long, its tube cylindric, slightly arcuate, about 11 mm. long, broad, its limb 5-parted, the lobes well developed, the median one irregularly rounded-acuminate with a narrow claw, the lateral ones elongate, conchiform, and obtusely pointed at the apex; stamens inserted well below the middle of the corolla-tube, included, entirely glabrous; filaments slender; anthers elliptic, emarginate at the base, rounded at the apex; pistil entirely glabrous; style 1--1.5 mm. long; stigma capitellate, subbilobed, papillose on the surface; ovary ovoid, 4-celled, each cell 1-ovulate; fruiting-calyx and fruits not known.

The type of this remarkable species was collected by Henri François Pittier de Fábrega (no. 3897) in a high forest along the Río Fató, at an altitude of 10 to 100 meters, above Nombre de Díos, Colón, Panama, on July 8, 1911, and is deposited in the United States National Herbarium at Washington. In his original publication Pittier bases the species on two specimens, his nos. 3897 and 4199, in the United States National Herbarium, both collected at the same locality, the latter on August 16, 1911. However, only the no. 3897 is inscribed by him "type specimen" on the sheet, so I am regarding that collection as the type collection only. The "Canal Zone" on the labels of 4199, which formed the basis of my recording of the species from the Canal Zone in previous publications on geographic distribution, is apparently an error, since Pittier states that the type locality is definitely in the Panamanian province of Colón.

The species inhabits wet forests and thickets, at altitudes of 2 to 250 meters, and has been collected in anthesis in February and July. The extremely stout, hollow branchlets and twigs, the large subsessile leaf-scars, the ternate leaves and racemes the large thin leaf-blades, and the large flowers characterize this species quite well. Pittier reports that its wood is little used, and that a common name is "iguanero". In all, 9 herbarium specimens, including the types of all the names involved, and 5 mounted photographs have been examined.

Citations: PANAMA: Colón: H. Pittier 3897 (B--photo of type, G--isotype, K--photo of type, N--isotype, N--isotype, N--photo of type, S--photo of type, W--678974--type, Z--photo of type), 4199 (Bm, N, W--679301). COLOMBIA: Cauca: Cuatrecasas 14271 (N). Putumayo: Cuatrecasas 10886 (W--1798858).

CITHAREXYLUM MACROPHYLLUM Poir. in Lam., Encycl. Méth. Bot. Suppl. 2: 367—368. 1811.

Synonymy: Citharexylon macrophyllum Poir. apud Steud., Nom. Bot., ed. 1, 202. 1821.

Literature: Poir. in Lam., Encycl. Méth. Bot. Suppl. 2: 367—368. 1811; Poir. in Lam., Dict. Sci. Nat. 9: 286. 1817; Steud., Nom. Bot., ed. 1, 202 (1821) and ed. 2, 375. 1840; Walp., Repert. 4: 78. 1845; Jacks., Ind. Kew. 1: 550. 1893; Pulle, Enum. Pl. Surin. 403. 1906; Moldenke, Geogr. Distrib. Avicenn. 19 & 21. 1939; Moldenke in Pulle, Fl. Surin. 4 (2): 291—293. 1940; Moldenke, Suppl. List Common Names 6. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 31, 33, & 88. 1942; Moldenke, Phytologia 2: 97. 1944; Moldenke, Alph. List Cit. 1: 60, 82, 205, 207, 277, & 299 (1946) and 2: 353, 448, 567, 582, 587, & 643. 1948; Moldenke, Bull. Torrey Bot. Club 75: 563. 1948; Moldenke, Alph. List Cit. 3: 669, 725, 756, 892, 951, & 954 (1949) and 4: 1040, 1066, & 1146. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 59, 66, 67, & 179. 1949.

Shrub or tree, to 23 m. tall; trunk to 30 cm. in diameter at the base, buttressed and fluted, the plank buttresses to 1 m.; bark dirty-gray; slash flaky; branchlets and twigs medium or stoutish, acutely or obtusely tetragonal, very minutely puberulent or subglabrate, mostly fistulose, brown (often very dark), lenticellate, the floriferous shoots pithy; nodes annulate; principal internodes 2.7--8 cm. long; leaf-scars borne on short ascending sterigmata 1—2.5 mm. long, large and often extending over the edge of the sterigmata and partially down their sides; leaves mostly ternate, occasionally decussate-opposite; petioles stout, 1—3.2 cm. long, mostly sulcate above, glabrous or subglabrate, brown, dark in drying; leaf-blades very firmly chartaceous or "thin-leathery", dark-green and shiny above, usually much lighter (or gray when fresh) beneath, stiff when fresh, oblong-elliptic or subobovate, 8.5—23 cm. long, 3.3—10 cm. wide, acute or acuminate at the apex, entire, acute or subcuneate at the base, very obscurely and minutely puberulous beneath when young, glabrous on both surfaces when mature, "rugose and scabrous" when fresh, bearing a pair of large, elongate, crateriform glands alongside the petiole at the very base beneath; midrib rather stout, plane above, prominent beneath; secondaries slender, 10—12 pairs, arcuate-ascending, usually plane above, prominulent beneath; vein and veinlet reticulation very fine and abundant, prominulent and conspicuous to the last detail beneath; racemes axillary and terminal, the axillary ones ternate, simple or compound with a pair of short lateral branches, erect or ascending (or nutant in fruit), 6—25 cm. long, to 1.5 cm. wide, rather densely many-flowered, unilateral; peduncles slender or (usually) stoutish, 1.5—3 cm. long, minutely puberulous, often with 1 bractlet-bearing node; rachis slender or (usually) stoutish, minutely puberulous; pedicels slender, about 1 mm. long, stouter but no longer in fruit, puberulent; bracts none; bractlets one pair or none, linear, about 4 mm. long, puberulent; prophylla setaceous, less than 1 mm. long; buds creamy-green or yellow; flowers sweet-scented; calyx green, tubular-cyathiform, 3.5—4 mm. long, about 2 mm. wide, usually not very patent during anthesis, glabrous or puberulent, its rim truncate or 5-dentate; corolla white, infundibular, its tube narrowly cylindric, 6—7 mm. long, arcuate, the limb 5-parted, the lobes ovate-lingulate, 2—3.5 mm. long, 1—1.5 mm. wide, obtuse at the apex; fruiting-calyx broadly cupuliform, indurated, 4—5 mm. long, about 7 mm. wide, minutely puberulent, its rim subtruncate, subentire; fruit elliptic, to 13 mm. long and 6 mm. wide, bony, not fleshy, apiculate, glabrous, faintly 2-sulcate, narrowed at the base and apex, light-brown in drying.

The type of this species was collected by Joseph Martin before 1800 at Cayenne, French Guiana, and is deposited in the Desfontaines herbarium. The species is said to inhabit sandy soils, forests, and swamps, and has been collected in anthesis from February through April and in June. The crateriform basal glands seen here are quite different from the thick swollen ones as are seen on C. macradenium Greenm. and the flat discoid ones of other species of the genus. The venation of the lower leaf-surface is very beautiful because of being prominulent to the last detail, not as coarsely so as in C. fruticosum L., but more finely and delicately. The leaf-blades are rarely rounded to a merely subacute base. It reminds one very much of C. macrochlamys Pittier, which differs chiefly in its much thinner leaf-blades and less prominulous venation on the lower surface. It has been confused in herbaria with C. cinereum L. [=C. fruticosum] and C. myrianthum Cham.; in fact, it also closely resembles the latter species. Mell & Mell 247 is anomalous in its woody branchlets of light-gray color, and its strictly opposite and smaller leaves. It appears very close to C. myrianthum, and, having been collected at "Georgetown", it may indeed represent a cultivated plant of this latter Brazilian species.

Lehmann B.T.645 may have been gathered in the department of Cauca; its label merely says "In Micay & Buenaventura". It closely resembles C. macrochlamys. The "C. myrianthum Cham." of Pulle, Enum. Pl. Surin. 403 (1906) is actually C. macrophyllum and is not the C. myrianthum of Chamisso, Linnaea 7: 117 (1832). Common names recorded for our species are "citharexylum a grandes feuilles", "cotelet à grandes feuilles", "kasaroballi", "leja gado", and "oeroejatoe". Hostmann 552 in the Paris herbarium has a label inscribed "Hortmann 552". In all, 69herbarium specimens, but not the type, and 4 mounted photographs have been examined.

Citations: COLOMBIA: Valle del Cauca: F. C. Lehmann B.T.645 (Cb, Cb, G, K, Le, N, V—6732). BRITISH GUIANA: Herb. Forest. Dept. Br. Guian. 4785 [field no. 2049] (N), 7709 [field no. J.B. 25] (N, S); Jenman 1854 (K, N--photo, U, Z--photo), 7038 (N, N, U), 7043 (F—48031, N), 7045 (B, K); Lockie s.n. [Herb. Br. Guian. Forest. Dept. 2026] (K, K, N); Mell & Mell 247 (N, W—1481569). SURINAM: B. W., Bureau of Forestry 1663 [5155] (Lg, N), 3891 (Ut), 4289 (Ut), 4712 (Ut), 4767 (Ut), 4772 (Ut), 5155 (Ut), 5907 (Ut), 5915 (Ut); Focke 39 (Le, Le), 122 (Le); Herb. Acad. Rheno-Traiect. 314 [7129] (N, Ut); Hostmann 552 (B, K, K, N, N—photo, P, Ut, V, V—285038, Z—photo), s.n. (Le); Hostmann & Kappler 552 (V—211666); Mus. Bot. Acad. Rheno-Traiect. s.n. (Ut); Samuels 108 (A, B, G, K, Le, N, P, W—866146, W—866147), 210 (B, G, K, N); Soeprato 26j (Ut); Splitgerber 595 (Le), 839 (Le); Wullschlägel 768 (Br, N).

CITHAREXYLUM MEXICANUM Moldenke in Fedde, Repert. 37: 229—230. 1934.

Literature: Moldenke in Fedde, Repert. 37: 229—230. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Cit. 1: 52 & 54 (1946), 2: 347 (1948), and 3: 755. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949.

Shrub or large tree; branchlets slender, light-brown or grayish, obtusely tetragonal, lenticellate, obscurely and very minutely puberulous; twigs slender, dark-brown in drying, minutely puberulous; nodes obscurely annulate; principal internodes 1.8—5.5 cm. long; leaf-scars borne on short ascending sterigmata, with overlapping edges; leaves decussate-opposite (or subopposite on young shoots); petioles slender, elongate, 0.9—4.2 cm. long, glabrate; leaf-blades thin-chartaceous, dark-green above, the immature ones often nigrescent in drying, lighter beneath, dull, oblong or elliptic to ovoid or rarely subrhomboid, 4—11.4 cm. long, 1.8—7 cm. wide, bluntly acute or obtuse at the apex, entire or sparsely serrate above the middle with large and coarse mostly apiculate teeth, acute or cuneate at the base, usually bearing a pair of small and inconspicuous glands at the very base, glabrate on both surfaces, often more or less punctate beneath; midrib slender, sometimes more or less flexuous, prominulent beneath; secondaries slender, 5—8 pairs, very irregular, arcuate-ascending, more or less obscurely anastomosing at the margins, prominulent beneath, sometimes slightly so above; vein and veinlet reticulation very irregular, sometimes rather conspicuous on both surfaces; racemes axillary (in the uppermost axils) and terminal, often terminating short axillary twigs, simple, ascending or nutant, rather densely many-flowered, 7—17 cm. long, to 1.5 cm. wide; peduncles slender or stoutish, 6—14 mm. long, glabrous; rachis slender, glabrous; pedicels filiform, 1—2 mm. long, glabrous; bracts and bractlets absent; prophylla setaceous, about 1 mm. long; calyx campanulate, about 3.1 mm. long and 2.4 mm. wide, lightly 5-costate, densely puberulent, the rim lightly and shortly 5-dentate; corolla infundibular, its tube broadly cylindric, about 3.9 mm. long, about 1.1 mm. wide at the base and to 2.8 mm. wide at the apex, externally glabrate, densely pilose in the throat within, the limb 5-parted, the lobes somewhat unequal, ovate, 1.5—1.8 mm. long, 1-1.4 mm. wide, rounded at the apex; fertile stamens 4, not plainly didynamous, included, inserted 1--1.5 mm. below the mouth of the corolla-tube; filaments 0.5--0.7 mm. long; anthers oblong, about 1.1 mm. long and 0.5 mm. wide; staminode filiform, about 0.7 mm. long; pistil included; style about 1.8 mm. long, glabrous, dilated into the ovary at the base; stigma very shortly bilobed, the lobes about 0.3 mm. long, not fimbriate; ovary oblong, about 1 mm. long and 0.8 mm. wide, glabrous, 4-celled; fruiting-calyx very shallowly cupuliform, light, about 2 mm. long and 5 mm. wide, glabrate, 5-ribbed, sometimes puberulent on the ribs, its rim rather deeply 5-lobed, with rounded and apiculate lobes; fruit subglobose, about 6 mm. long and wide, fleshy, glabrous, shiny, black and 2-sulcate in drying.

The type of this species was collected by Eugène Bourgeau (no. 3229) at San Cristobal, in the region of Mount Orizaba, Vera Cruz, Mexico, on October 10, 1866, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. It was originally distributed as a species of Duranta. It was Dr. Greenman who first pointed out that it is rather a member of the genus Citharexylum and probably conspecific with Botteri 458 from the same locality. In fact, all three known collections are from the same Mount Orizaba area. Two of the Paris isotypes are inscribed "grand arbre" and the other "grand arbuste". It has been collected in flower in July and in fruit in October. In all, 9 herbarium specimens, including the type, and 4 mounted photographs have been examined.

Citations: MEXICO: Vera Cruz: Botteri 458 (G); Bourgeau 3229 (B--photo of type, F--976778--isotype, G--isotype, K--type, N--isotype, N--photo of type, P--isotype, P--isotype, P--isotype, S--photo of type, Z--photo of type); F. Müller s.n. [July, 1853](M).

CITHAREXYLUM MICROPHYLLUM (P. DC.) O. E. Schulz in Urb., Symb. Antill. 6: 59. 1909.

Synonymy: Myginda ? microphylla P. DC., Prodr. 2: 12. 1825. Ilex microphylla Spreng. ex P. DC., Prodr. 2: 12, in syn. 1825 [not I. microphylla Hook., 1837]. Crossopetalum microphyllum (P. DC.) Kuntze, Rev. Gen. Pl. 1: 116. 1891.

Literature: P. DC., Prodr. 2: 12. 1825; Steud., Nom. Bot., ed. 2, 1: 802 (1840) and 2: 170. 1841; Kuntze, Rev. Gen. Pl. 1: 116. 1891; Urb. in Engl., Bot. Jahrb. 15: 324. 1892; Jacks., Ind. Kew. 1:1206 (1893) and 2: 275. 1894; Durand. & Jacks., Ind. Kew. Suppl. 1: 116. 1901; Metz, Beih. Bot. Centralbl. 15: 379. 1903; Urb. in Urb. & Graebn., Festschrift Aschers. 58. 1904; O. E. Schulz in Urb., Symb. Antill. 6: 59. 1909; Prain, Ind. Kew. Suppl. 4: 49. 1913; Moldenke, Geogr. Distrib. Avicenn. 7. 1939; Moldenke, Alph. List Common Names 13 & 20. 1939; Moldenke, Prelim. Alph. List Invalid Names 28 & 33. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 26 & 88. 1942; Moldenke, Alph. List Invalid Names 22, 27, & 33. 1942; Moldenke, Phytologia 2: 97. 1944; Moldenke, Alph. List Cit. 1: 39, 188, & 189 (1946), 2: 427 & 437 (1948), 3: 654 (1949), and 4: 1054 & 1061--1063. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 47 & 179. 1949.

Shrub, to 2 m. tall; branches rather stout and woody; branchlets slender, rather stiff, obtusely tetragonal (sometimes obscurely so), light, very obscurely pulverulent or short-pilose to subglabrate, bearing few or many short spine-like twigs, the floriferous ones greatly abbreviated; nodes not annulate; principal internodes abbreviated, 2--13 mm. long; leaf-scars subsessile (on young twigs) or borne on short slender ascending sterigmata; leaves typically decussate-opposite, often crowded or clustered on greatly abbreviated spurs, sometimes scattered through the members of each closely crowded pair being only subopposite; petioles very slender, 1--9 mm. long, glabrous or pilose, not granduliferous; leaf-blades chartaceous or membranous, brownish-green on both surfaces or dark-green above and lighter beneath, oblong or narrow-oblong to linear or narrow-elliptic, 4--40 mm. long, 2.5--6 mm. wide, obtuse or rounded to emarginate at the apex, entire and subrevolute along the margins, acute or more or less acuminate to subcuneate at the base, not glanduliferous at the base, glabrous or subglabrate and punctulate on both surfaces or slightly hirtellous to villosulous on the midrib and secondaries beneath, smooth to touch above, reticulate-nervose beneath; midrib very slender, somewhat impressed above, prominulous beneath; secondaries several, usually 2 or 3 per side, ascending, obscure above, manifest beneath; veinlet reticulation obscure above, visible beneath; racemes apparently terminating short spur-like twigs, reduced to 1--6 flowers, inconspicuous, very small, about 6 mm. long, often sessile; peduncles, rachis, and pedicels abbreviated, filiform, glabrate, or the rachis tomentose; bracts and bractlets none; prophylla setaceous, minute, about 0.5 mm. long; calyx cyathiform, about 1.5 mm. long, externally glabrous; corolla greenish or white, hypocrateriform, about 2.5 mm. long, externally glabrous, villous in the throat within, the lobes narrowly obovate, about 1/3 as long as the tube; stamens 4; filaments about 0.33 mm. long; anthers about 0.75 mm. long; staminode rudimentary; style about 1 mm. long; fruiting-pedicels about 0.5 mm. long; fruiting-calyx light and herbaceous, shallowly cupuliform, about 2 mm. long and 4 mm. wide, glabrous, its rim obscurely 5-lobed or merely erose; fruit subglobose or oblong, red or scarlet, fleshy, 3--8 mm. long, 2.5--7 mm. wide, glabrous and shiny, truncate at the apex, 2-sulcate in drying; pyrenes bilocular; embryo oblong, 1.5--2.5 mm. long.

The type of this very distinct species was collected by Carlo Giuseppe Bertero (no. 513) at Santo Domingo, Dominican Republic. Although this plant has been in three separate genera in its past nomenclatural history, Urban as far back as 1892 suggested that it is actually verbenaceous, while Radlkofer in August, 1900, pointed out on a sheet in the Munich herbarium that it probably belongs in Citharexylum. Schulz claims that it is related to C. berlandieri B. L. Robinson, but I feel that it is closer to C. brachyanthum (A. Gray) A. Gray. It has been collected in limestone regions, on mountaintops, and is said to prefer arid thickets, especially along roadsides, ascending to 150 m.

altitude. Ekman says that it is "not common". It has been collected in anthesis in February and June, and in fruit in February and July. Drawings of the hairs may be seen on the Munich herbarium isotype and on the photographs of this specimen. It is worthy of note that the Index Kewensis Supplement 4 erroneously cites this binomial to page "9", instead of "59", in Urban's Symbolae.

Common names reported are "gatigal" and "mala-muger". In all, 27 herbarium specimens, including the types of all the names involved, and 9 mounted photographs have been examined.

Citations: HISPANIOLA: Dominican Republic: Bertero 513 (B--isotype, B--isotype, E--photo of isotype, Mu--3903--isotype, N--photo of isotype, N--photo of isotype, S--photo of isotype, W--photo of isotype, Z--photo of isotype, Z--photo of isotype). Haïti: Ekman H.1019 (B, B, N, N, S, S, W--1304767), H.4456 (B, S, S, W--1410231), H.8508 (B, N--photo, S, S, W--1413103, Z--photo), H.8540 (B, S); Leonard & Leonard 13143 (A, N, W--1451821), 13330 (E--993057, K, W--1451996, W--1451997).

CITHAREXYLUM MIRIFOLIUM Moldenke in Fedde, Repert. 37: 230--231. 1934.

Literature: Moldenke in Fedde, Repert. 37: 230--231. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 20. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 32 & 88. 1942; Moldenke, Alph. List Cit. 1: 230 (1946), 2: 333 & 427 (1948), and 4: 1067. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 62 & 179. 1949.

Tree, to 4 m. tall, or small, somewhat branched, adsurgent shrub; bark light-colored; branchlets medium, light-gray, very sharply tetragonal, lenticellate, fistulose, glabrous; twigs slender, sharply tetragonal, gray or substramineous, glabrous; nodes obscutely annulate; principal internodes 0.7--3 cm. long; leaves decussate-opposite (or subopposite on young twigs), borne on stout, corky, closely appressed, glabrous sterigmata 1--4 mm. long; petioles slender, 4--6 mm. long, flattened above, margined, glabrous; leaf-blades firmly chartaceous or subcoriaceous, stiff, bright-green and very shiny above, dull beneath, appearing as though varnished above, oblong-oblanceolate, 3.5--6.7 cm. long, 1.8--2.7 cm. wide, acute or rounded at the apex, entire but slightly subrevolute along the margins in drying, cuneate at the base and prolonged into the petiole, not glanduliferous, glabrous on both surfaces; midrib slender, prominent beneath, prominulent above; secondaries slender, 5--7 pairs, arcuate-ascending, anastomosing at the margins, slightly prominulent beneath, very greatly and beautifully so above; vein and veinlet reticulation abundant, very slightly prominulent (or the lesser parts obscure) beneath, very pronouncedly and conspicuously prominulent and reticulate above; racemes terminating the twigs, erect, short, 4.5--10 cm. long, 2.5--2.7 cm. wide in fruit, rather few- or submany-fruited; peduncles rather heavy and stout in fruit, 7--15 mm. long, stramineous, lenticellate, glabrous, not nodose nor bracteate; rachis strong and stout in fruit, stramineous, glabrous; fruiting-pedicels stout, corky, about 3 mm. long, sterigma-like; bracts and bractlets absent or caducous; prophylla setaceous; flowers not seen; fruiting-calyx shallowly cupuliform, patent, heavy, about 3.5 mm. long and 8.5 mm. wide, glabrous, ribbed, its rim deeply 5-lobed with blunt and broadly triangular lobes; fruit oblong or ovoid, about 11 mm. long and 10 mm. wide when mature, violet when immature, finally becoming black, very fleshy and shiny, glabrous, 4-seeded.

The type of this strikingly handsome species was collected by Wilhelm Gehriger (*no. 269*) on the quebrada of the town of Mucurubá, in declivities and pedregales that are very steep, sunny, and dry, at an altitude of 2700 to 2800 meters, Mérida, Venezuela, on June 27, 1930, and is deposited in the herbarium of the Arnold Arboretum at Cambridge. It is a most beautiful species because of its marvelously handsome leaf-blades on which the venation is very prominulent and stands out most pronouncedly and conspicuously, forming a beautiful reticulum on the upper surface. Only the larger elements are prominulent beneath, the remainder being obscure there. The blades are so very shiny above that they appear as though varnished, a character rendered even more pronounced by the contrast with the dull under surface. The plant is obviously closely related to *C. fruticosum* L., and has been collected in fruit in February and June. In all, 10 herbarium specimens, including the type, and 5 mounted photographs have been examined.

Citations: VENEZUELA: Mérida: *Bernardi 6163* (N); *Gehriger 269* (A—type, B—photo of type, Cb—isotype, D—691807—isotype, E—1003718—isotype, F—690253—isotype, K—photo of type, N—isotype, N—isotype, N—photo of type, S—photo of type, Ve—12647—isotype, W—1498556—isotype, Z—photo of type).

CITHAREXYLUM MOCINNI D. Don, Edinb. New Philos. Journ. 11 (Jan.—Mar.): 238. 1831.

Synonymy: *Citharexylum tomentosum* Sessé & Moc. ex D. Don, Edinb. New Philos. Journ. 11 (Jan.—Mar.): 238, in syn. 1831 [not *C. tomentosum* Poir., 1811, nor H.B.K., 1817, nor Klotzsch & Karst, 1940]. *Citharexylum rugendasii* Cham., Linnaea 7: 120—121. 1832. *Citharexylon rugendasii* Cham. apud Walp., Repert. 4: 76—77. 1845. *Citharexylon mocinni* D. Don apud Walp., Repert. 4: 75. 1845. *Citharexylum mocini* D. Don apud Schau. in A. DC., Prodr. 11: 614. 1847. *Citharexylum tomentosum* Moc. & Sessé apud Jacks., Ind. Kew. 1: 550, in syn. 1893. *Citharexylum rugendasii* var. *endlichii* Loes. ex Moldenke, Prelim. Alph. List Invalid Names 17, in syn. 1940. *Citharexylum mocinnii* D. Don ex Moldenke, Alph. List Invalid Names 58, in syn. 1942. *Citharexylon mocini* D. Don, in herb.

Literature: D. Don, Edinb. New Philos. Journ. 11 (Jan.—Mar.): 238. 1831; Cham., Linnaea 7: 120—121. 1832; Steud., Nom. Bot., ed. 2, 1: 375. 1840; Walp., Repert. 4: 75—77. 1845; Schau. in A. DC., Prodr. 11: 612. 1847; Jacks., Ind. Kew. 1: 550. 1893;

Yuncker, Field Mus. Publ. Bot. 17: 389. 1938; Moldenke, Geogr. Distrib. Avicenn. 13 & 16. 1939; Moldenke, Prelim. Alph. List Invalid Names 17 & 18. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16, 80, & 88. 1942; Moldenke, Alph. List Invalid Names 14, 15, & 58. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 3. 1943; Moldenke, Alph. List Cit. 1: 52, 53, 117, 192, & 218. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 5. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 58, 73, & 79. 1948; Moldenke, Alph. List Cit. 2: 328, 332, 339, 342, 419, 429, 448, 459, 540, & 541 (1948) and 3: 659, 664, 691, 714, 715, 900, 901, 926, 963, 1022, 1066, & 1152. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949; Matuda, Am. Midl. Nat. 44: 575. 1950; Moldenke, Phytologia 4: 68. 1952; Moldenke, Inform. Set 48 Spec. [2]. 1954.

Shrub or tree, to 17 m. tall; branchlets medium or stoutish, obtusely or acutely tetragonal, very medullose, densely furfuraceous-tomentose with cinereous or ochraceous stellate hairs; nodes annulate; principal internodes 3.5--9.2 cm. long; leaves decussate-opposite, borne on stout, ascending, tomentose sterigmata 1--5 mm. long; petioles stout, 0.9--2.5 cm. long, canaliculate above, densely stellate-tomentose; leaf-blades very firmly chartaceous, membranous when immature, dark-green and very shiny above, much lighter beneath, oblong or ovoid, 10--23.5 cm. long, 3.4--8.1 cm. wide, acuminate at the apex, entire, often very slightly revolute along the margins in drying, usually broadly rounded at the base, rarely acute or even subcuneate, slightly prolonged into the petiole and there bearing a pair of rather inconspicuous black glands, glabrous above except for the tomentose midrib, very densely floccose-tomentose with incanous or ochraceous hairs beneath; midrib stout, more or less impressed and tomentose above, very prominent beneath; secondaries slender, 6--8 pairs, arcuate-ascending, more or less impressed above, prominulent beneath; vein and veinlet reticulation abundant, conspicuous above (the larger parts often subimpressed, the remainder slightly prominulous), obscured by the pubescence beneath; racemes axillary in the uppermost axils and terminal, the axillary ones simple, the terminal ones sometimes compound with a pair of lateral branches as long as the central one (the lateral branches often also bearing a pair of secondary branches), long and slender, erect to nutant or pendent, 14--50 cm. long, 1--1.5 cm. wide, densely many-flowered; peduncles slender or stout, often abbreviated, 1--4 cm. long, densely short-tomentose, mostly nodose, bearing bracts or bractlets and buds at the nodes; rachis slender or stoutish, densely short-tomentose; pedicels slender or stout, 1--2.5 mm. long, short-tomentose, sometimes almost obsolete; bracts often present, large and foliaceous; bractlets small, linear or ovate, 1--4 mm. long, densely tomentose; prophylla linear, 1--2 mm. long, short-tomentose; flowers small, often subsessile, alternate, more densely crowded than in most members of the genus; calyx urceolate-obconic, about 3 mm. long, membranous, 5-nerved, hirtellous, its rim 5-dentate, the teeth broadly triangular, acute at the apex; corolla white, its tube obconic, about 4 mm. long, barbate-villous in the throat and at the insertion of the stamens within, the limb small, pubescent on both surfaces, the lobes unequal, spreading, elliptic, obtuse at the apex, two smaller and shorter than the rest; stamens 4, inserted low in the corolla-tube, subequal, scarcely didynamous, included, the fifth rudimentary, inserted opposite the sinus of the smaller corolla-lobes; filaments rather long, ciliate; anthers ovate; style slender, equaling the stamens, glabrous; stigma thickened, emarginate; ovary obovate, glabrous; fruiting-calyx very shallowly cupuliform, about 2.5 mm. long and 6 mm. wide, lightly tomentose or pubescent, 5-ribbed, its rim subentire or shortly 5-apiculate; fruit oblong, about 9 mm. long and 7 mm. wide, fleshy, pale-green when immature, shiny, glabrous, 2-sulcate in drying.

The type of this distinctive species was collected by Martín Sessé y Lacasta, José Mariano Mociño, Juan Diego del Castillo, and José Maldonado (no. 2375) somewhere in Mexico before 1809, and is deposited in the herbarium of the Jardin Botanico at Madrid. The type of C. rugendasii was collected by Christian Julius Wilhelm Schiede (no. 84) at Jalapa, Vera Cruz, Mexico, before 1833, and is deposited in the herbarium of the Botanisches Museum at Berlin. It is named in honor of Johann Moritz Rugendas (1799--?), German artist who accompanied Langsdorff in Brazil from 1821 to 1825, then resided in Italy and Sicily from 1827 to 1829, returning to South America and traveling there from 1831 to 1846. It has shorter and more slender racemes than are seen on the majority of other specimens examined and is almost the only collection that has the terminal inflorescences decidedly compound.

The type of C. rugendasii var. endlichii was collected by Rudolf Endlich (no. 1546) -- in whose honor it was named — in rainforests at 1450 meters altitude at Monte Paeho, near Jalapa, Vera Cruz, on February 1, 1907, and is deposited in the herbarium of the Botanisches Museum at Berlin. Loesener's description, placed on the type sheet in September, 1910, reads as follows: "foliis tenioribus basi acutis vel cuneatis a type recedens". Its leaf-blades are membranous and acute or subcuneate at the base and the pubescence is slightly sparser. It appears to me, however, to be an immature specimen and was collected in exactly the same locality as Endlich 1518, which is typical C. mocinni.

The McVaugh 12092 collection has its racemes all solitary and much elongated, about 50 cm. long, on all the seven specimens seen, with no side branches at all at any time. In general, the long racemes, taken with the mostly ovoid and greatly elongated acuminate leaf-blades and dense tomentose pubescence on the lower leaf-surface, characterize this species very well. Schauer states that C. mocinni differs from C. rugendasii only in its nodding racemes.

The species has been collected in open forests, rainforests, cloud forests, woods and virgin forests, damp forests, wet ravines, and hills, from 1350 to 2800 meters altitude, blooming from November through February and in April, July, and September, and in fruit from December to February and in May. Galeotti describes the species as rare in the Cordillera of Vera Cruz, where it ascends to 4000 feet altitude and is said to bloom from June to October. Hinton also describes it as "rare". His nos. 5393 and 8744 were taken from the selfsame plant, according to his own notes.

Material of this species has been confused in herbaria with C. tomentosum H.B.K. [=C. kunthianum Moldenke] of northern South America, and Steudel actually says that "Citharexylon regundasii" is native to Brazil! This is completely incorrect. The C. moldenkeanum Standl. reduced to synonymy under C. mocinni by me in my Prelim. Alph. List Invalid Names 17 (1940), actually belongs with var. longibracteolatum Moldenke. It should be pointed out that up to March, 1942, I regarded "mocini" as the correct spelling for the specific part of the accepted name for this species, following Schauer, and so spelled it in all my publications and on all annotation labels. Since then, however, I have adopted the original spelling, "mocinni", because I see no valid reason for changing this under the pretext of "correcting" it.

In all, 78 herbarium specimens, including the types of all the names involved, and 13 mounted photographs have been examined.

Citations: MEXICO: Chiapas: Matuda 1884 (Dr, Mh, Mi, N, N, N), 4537 (E—1214213, Ld, Me, Mh, N). Durango: Linden s.n. [Pueblo Nuevo] (P). México: Hinton 5393 (E—1102069, E—1208070, K, N), 6057 (E—1102068, K, Me, N, N), 8393 (Me), 8744 (Au, F—878774, F—878778, Fs, K, Me, N, N, N); Stanton 8744 (Mi). Nayarit: Mc Vaugh 12092 (Le, Mi, Mi, Mi, Mi, Mi, Mi). Vera Cruz: Botteri 244 (G); Bourgeau 3115 (Br, P, P, P, P, W—209522); Endlich 1518 (B), 1546 (B, K—photo, N—photo, S—photo, Z—photo); Galeotti 7121 (Br, Br, P); Liebmann 11304 (Cp, Cp, N), 15489 (Cp, F—689261, W-1492786), 15490 (Cp); M. Martens s.n. [prov. Jalapa] (Br); Schiede 84 [Macbride photos 17599] (B, E—119061, E—119062, F—663028—photo, K—photo, Kr—photo, L, L, M, N—photo, N—photo, P, S—photo, V—285054, Z—photo), 2128, in part (S), s.n. [pr. Veracruz] (L); Schiede & Deppe s.n. [Jalapa] (Bm, Cb). State undetermined: Collector undesignated s.n. [Tropic. Mexico] (Dr); Herb. Pavon s.n. (X); Sessé, Mociño, Castillo, & Maldonado 2375 (F—851476—isotype, N—photo of type, Q—type, Q—isotype, Q—isotype, Q—isotype, Z—photo of type).

CITHAREXYLUM MOCINNI var. LONGIBRACTEOLATUM Moldenke, Phytologia 1: 415 [as "mocini"]. 1940; Alph. List Invalid Names 58.1942

Synonymy: Citharexylum moldenkeanum Standl. ex Moldenke, Prelim. Alph. List Invalid Names 17, in syn. 1940. Citharexylum mocini var. longibracteatum Moldenke apud Matuda, Am. Midl. Nat. 44: 575, sphalm. 1950. Citharexylum mocinnii var. longibracteatum Moldenke, in herb.

Literature: Moldenke, Phytologia 1: 415. 1940; Moldenke, Prelim. Alph. List Invalid Names 17. 1940; Moldenke, Suppl. List Invalid Names 11. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16, 19, 21, 80, & 88. 1942; Moldenke, Alph. List Invalid Names 14 & 58. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 3. 1943; Moldenke, Alph. List Invalid Names Suppl. 1: 5. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 73. 1948; Moldenke, Alph. List Cit. 2: 340, 348, 349, 351, & 429 (1948), 3: 714, 715, 961, & 973 (1949), and 4: 1152. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29, 35, 37, & 179. 1949; Matuda, Am. Midl. Nat. 44: 575. 1950.

This variety differs from the typical form of the species in having the bractlets of its flowering racemes linear or narrowly spatulate, 4—10 mm. long, elongating in fruiting racemes to 25 mm. and then even more conspicuous, persistent.

It is said to be a shrub or small tree, to 15 m. tall, the trunk to 70 cm. in diameter; stems green, covered with gray puberulence; leaves soft in texture, the blades subcoriaceous, varying from bright grass-green or yellow gray-green to dull-green or dark-green above, varying from gray-buff-green or buff-yellowish-green to buff-silvery-gray or pale-green beneath; inflorescence nodding; peduncles pale-green, nodding; flowers fragrant; calyx rich-green; corolla white, its tube greenish, the lobes spreading; fruit ovoid, orange-colored, obtuse at the apex, shiny.

The type of the variety was collected by Eizi Matuda (*no. S. 181*) on Mount Pasitar, Chiapas, Mexico, on December 28, 1936, and is deposited in the Britton Herbarium at the New York Botanical Garden. It has been found in damp forests, open forests, wet ravines, and mixed pine-hardwood barrancas, at altitudes of 1350 to 3000 meters, in flower from November through February, and in fruit in February. *Matuda 2663* in the Chicago herbarium has the bractlets very long in the main raceme, but much shorter in the side racemes. *C. moldenkeanum* of Standley was at first regarded by me as typical *C. mocinni* and was so cited by me until 1940. It is now obvious that this taxon is identical with the variety here under discussion.

In all, 27 herbarium specimens, including the types of all the names involved, have been examined.

Citations: MEXICO: Chiapas: *Matuda 408* (E—1278351, Mh, N), *2663* (F—1004897, Mh, Mi, Mi, N), *3923* (E—1195658, Mh, Mi, N), *16264* (N, N), *S.181* (E—1126429—isotype, Mi—isotype, N—type). GUATEMALA: Quezaltenango: *Steyermark 33979* (F—1049090). Sacatepéquez: *P. C. Standley 63700* (F—984949, F—984958, N). San Marcos: *Steyermark 36608* (F—1056597), *36720* (F—1041193, N), *36856* (F—1041194).

CITHAREXYLUM MONTANUM Moldenke in Fedde, Repert. 37: 231—232. 1934.

Literature: Moldenke in Fedde, Repert. 37: 231—232. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 19 & 22. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 31, 33, 71, & 88. 1942; Moldenke, Alph. List Cit. 1: 133

(1946), 2: 335, 336, & 611 (1948), 3: 857 (1949), and 4: 1001, 1060, & 1078. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 59, 69, 157, & 179. 1949; Moldenke, Phytologia 4: 451. 1953; Biol. Abstr. 27: 3372. 1955.

Tree, to 12 m. tall; branches extremely stout and robust; branchlets and twigs very stout, obtusely tetragonal, often more or less flattened and ampliate at the nodes, gray or brown, medullose, densely furfuraceous-tomentose with incanous or flavescent hairs; nodes annulate; principal internodes 3--6.6 cm. long; leaves decussate-opposite; leaf-scars extremely large, often rectangular, borne on very short ascending or appressed sterigmata; petioles very stout, 1.5--3 cm. long, rugate in drying, ampliate and elongate at the base, very densely flavescent- and furfuraceous-tomentose; leaf-blades thick and firm, subcoriaceous, oblong, 6.3--20.5 cm. long, 2.9--8 cm. wide, acute or short-acuminate at the apex, entire, rounded and obtuse at the base or acute, mostly bearing a pair of inconspicuous glands at the very base, sparsely furfuraceous above when immature, glabrous when mature, always extremely densely furfuraceous-tomentose with flavescent hairs beneath; midrib very stout, more or less impressed above, very prominent and often rugate beneath; secondaries numerous, slender, 11--16 pairs, regular, arcuate-ascending, plane or very slightly impressed above, prominulent beneath; vein and veinlet reticulation very slightly impressed or obscure above, mostly hidden by the tomentum beneath; racemes axillary and terminal, erect or nutant, extremely stout and robust, simple, 6.5--12.5 cm. long, 1--2 cm. wide (in bud), extremely densely many-flowered; peduncles very stout, 1--2 cm. long, densely tomentose; rachis extremely stout and robust, densely furfuraceous-tomentose with incanous or flavescent hairs; pedicels very stout and sterigma-like, to 1 mm. long, very densely white-tomentose; bracts and bractlets absent; prophylla very abundant and often conspicuous, linear, 1--4 mm. long, tomentose; calyx tubular, about 6 mm. long and 2.6 mm. wide, densely ferruginous-tomentose, bilabiate, the 2 sinuses acute and about 2.6 mm. deep, one lip often not lobed and the other 2-lobed; corolla greenish-white or white, hypocrateriform, its tube broadly suburceolate, about 5.2 mm. long, about 1.3 mm. wide at the base and to 3.1 mm. wide above the middle, slightly narrowed at the apex, externally glabrous, densely pilose in the throat within, the limb 5-parted, the lobes variable in size, oblong or ovate-lingulate, about 2.8 mm. long and 2.6 mm. wide, acute at the apex; stamens 4, subequal, inserted about 3.1 mm. below the mouth of the corolla-tube, included; filaments about 1 mm. long; anthers oblong, about 2 mm. long and 0.5 mm. wide; pistil included; style thick, about 1.3 mm. long; stigma to 0.9 mm. wide, very shortly 2-lobed, the lobes about 0.3 mm. long; ovary obovate, about 1.5 mm. long and 1.3 mm. wide, glabrous; fruiting-calyx and fruit not known.

The type of this species was collected by Ellsworth Paine Killip and Albert Charles Smith (no. 16955) at the edge of woods in the vicinity of California, at al altitude of 2800 meters, Santander, Colombia, in the eastern cordillera, between January 11 and 27, 1927, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collectors describe it as a tree 15--20 feet tall. It has been collected at altitudes of 1800 to 2800 meters, in anthesis from December through March. The flowers apparently fall off very easily, because on all specimens examined most of the individual flowers had falled off, leaving the lower part of the racemes devoid of flowers and thus exposing and rendering conspicuous the large prophylla. In all, 12 herbarium specimens, including the type, and 5 mounted photographs have been examined.

Citations: COLOMBIA: Antioquia: Toro 964 (Fn--1667, N). Santander: Killip & Smith 16955 (B--photo of type, F--762341--isotype, G--isotype, K--photo of type, N--type, N--photo of type, S-photo of type, W--1352630--isotype, Z--photo of type). ECUADOR: Napo-Pastaza: Asplund 10159 (S, S). Province undetermined: Rimbach 169 (F--717110, N). CULTIVATED: Colombia: Cuatrecasas 13550 (N, W--1851382).

CITHAREXYLUM MONTANUM var. CHIMBORAZENSE Moldenke, Phytologia 3: 286, nom. nud. (1950) & 4: 175. 1953.

Literature: Moldenke, Phytologia 3: 286 (1950) & 4: 175. 1953; Moldenke, Mem. N. Y. Bot. Gard. 9: 176. 1955; Biol. Abstr. 27: 3372. 1955.

This variety differs from the typical form of the species in having its inflorescences very loosely few-flowered.

The type of the variety was collected by Wendell Holmes Camp (no. E.3455) in moist forested valleys in the afternoon-fog belt, cañon of the Río Chanchan, about 5 km. north of Huigra, at an altitude of 5000 to 6500 feet, Chimborazo, Ecuador, between May 19 and 28, 1945, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is known thus far only from the type specimen.

Citations: ECUADOR: Chimborazo: Camp E.3455 (N--type).

CITHAREXYLUM MONTEVIDENSE (Spreng.) Moldenke, Phytologia 1: 17. 1933.

Synonymy: Ehretia montevidensis Spreng. in L., Syst. Veg., ed. 16, 1: 647. 1825. Citharexylum barbinerve Cham., Linnaea 7: 116--117. 1832. Citharexylon barbinerve Cham. ex Steud., Nom. Bot., ed. 2, 1: 375. 1840. Citharexylon scarbinerve Steud., Nom. Bot., ed. 2, 1: 543, sphalm. 1840. Citharexylon barbinerve Cham. & Schlecht. ex Arechavaleta, Ann. Mus. Montevid. 4: 151, pl. 1. 1903. Rauwolfia bilabiata Larrañ., Escritos D. A. Larrañ. 2: 85. 1923. Rauwolfia arborea Larrañ., Escritos D. A. Larrañ. Atlas 1: pl. 132. 1927. Citharexylon montevidense (Spreng.) Moldenke ex Herter, Beih. Bot. Centralbl. 59: 275. 1939. Cytharexylum montevidense (Spreng.) Moldenke apud Doello-Jurado, Physis 19: 406, sphalm. 1943. Citarexylon montevidense (Spreng.) Moldenke apud Cabrera & Dawson, Rev. Mus. La Plata, new ser., sec. bot., 5: 278, fig. 3c, sphalm. 1944. *Cytarexylon montevidense* (Spreng.) Moldenke apud Cabrera & Dawson, Rev. Mus. La Plata, new ser., sec. bot., 5: 356 & 378, pl. 6, fig. 1, sphalm. 1944. *Citharexylum barbinervi* Cham. ex Moldenke, Alph. List Invalid Names Suppl. 1: 5, in syn. 1947. *Cytharexylon montevidense* (Spreng.) Moldenke apud Cabrera, Lilloa 20: cuadro iv, sphalm. 1949. *Citharerexilon montevidense* Cham., in herb. *Cytharexylon barbinerve* Cham., in herb.

Literature: Spreng. in L., Syst. Veg., ed. 16, 1: 647. 1825; Cham., Linnaea 7: 116--117. 1832; Steud., Nom. Bot., ed. 2, 1: 375 & 543. 1840; Walp., Repert. 4: 72--73. 1845; Schau. in A. DC., Prodr. 11: 610. 1847; Schau. in Mart., Fl. Bras. 9: 267--268. 1851; Gibert, Enum. Pl. Montev. 45. 1873; Jacks., Ind. Kew. 1: 549 & 823. 1893; Arechavaleta, Ann. Mus. Montevid. 4: 151, pl. 1. 1903; Briq., Ann. Conserv. & Jard. Bot. Genèv. 7--8: 318. 1904; Lillo, Cont. Con. Arboles Argent. 104. 1910; Glaz., Bull. Soc. Bot. France Mém. 3: 545. 1911; Molfino, Flora Esp. 285. 1921; Larrañ., Escritos D. A. Larrañ. 2: 85 (1923) and Atlas 1: pl. 132. 1927; Herter, Anal. Mus. Hist. Nat. Montevid., ser. 2, 2: 418--419. 1928; Herter, Flórula Urug. Pl. Vasc. 104. 1930; Stapf, Ind. Lond. 2: 220. 1930; Moldenke, Phytologia 1: 17. 1933; Parodi, Rev. Argent. Agron. 1: 200. 1934; Molfino, Trab. Inst. Bot. & Farm. Buenos Aires 53: 57. 1935; Latzina, Trab. Inst. Bot. & Farm. Buenos Aires 54: 78 & 112. 1935; Troncoso, Darwiniana 3: 56. 1937; Latzina, Lilloa 1: 188. 1937; Herter, Revist. Sudam. Bot. 4: 185. 1937; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Alph. List Common Names 2, 11, 22, & 29. 1939; Moldenke, Geogr. Distrib. Avicenn. 25, 28, 29, & 36. 1939; Herter, Beih. Bot. Centralbl. 59: 275. 1939; Parodi, Darwiniana 4: 55. 1940; Moldenke, Prelim. Alph. List Invalid Names 15, 16, & 25. 1940; Moldenke, Lilloa 6: 317--318 (1941) and 8: 414. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 36, 40--42, 71, & 88. 1942; Moldenke, Alph. List Invalid Names 13, 14, & 24. 1942; A. Schultz, Introd. Estud. Bot. Sist., ed. 2, 483, 484, & 535. 1943; Doello-Jurado, Physis 19: 405--406. 1943; Doello-Jurado, Algos Mas Sobre Prot. Nat. 6--7. 1943; Rosengurtt, Estud. Prad. Nat. Urug. 3: 84 & 234. 1943; Cabrera & Dawson, Rev. Mus. La Plata, new ser., sec. bot., 5: 278, fig. 3c, 356, & 378, pl. 6, fig. 1. 1944; Moldenke, Phytologia 2: 97. 1944; Augusto, Fl. Rio Grande do Sul 229 & 236. 1946; Moldenke, Alph. List Cit. 1: 12, 27, 39, 50, 80, 83, 86, 120, 128, 136, 215, 226, & 234. 1946; Moldenke, Phytologia 2: 346. 1947; Lombardo, Fl. Arb. Arbores. Urug. 186--187 & 203. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 5 & 8. 1947; Moldenke, Castanea 13: 121. 1948; Van Rensselaer, Trees of Santa Barbara, rev. ed., 163. 1948; Moldenke, Alph. List Cit. 2: 328, 343, 349, 370, 372, 403, 441, 442, 448, 457, 485, 500, 533, & 581 (1948), 3: 690, 703, 704, 748, 764, 772, 798, 809, 844, 848, 862, 863, 865, 890, 896, 897, 920-922, & 953 (1949), and 4: 980, 1010, 1013, 1069, 1070, 1072, 1080, 1088, 1089, 1104, 1106, 1166, 1172, 1176, 1179, 1253, & 1294. 1949; Cabrera, Lilloa 20: 321 & cuadro iv. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76, 98, 100, 103, 157 & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Stellfeld, Trib. Farmac. 19 (10): 169. 1951; Moldenke, Journ. Calif. Hort. Soc. 15: 85. 1954; Lombardo, Invent. Pl. Cult. Montevid. 67 & 266. 1954; Rambo, Sellowia 6: 59 & 84. 1954; Menninger, 1955 Price List 5 (1954) and 1956 Price List [4]. 1955.

Illustrations: Arechavaleta, Ann. Mus. Montevid. 4: 151, pl. 1. 1903; Larrañ., Escritos D. A. Larrañ. Atlas 1: pl. 132. 1927; Cabrera & Dawson, Rev. Mus. La Plata, new ser., sec. bot., 5: fig. 3c & pl. 6, fig. 1. 1944.

Tall shrub or tree, to 15 m. tall; trunk erect, to 50 cm. in diameter; branches and branchlets stoutish or medium, woody, light-gray, obtusely tetragonal, glabrate, armed with a pair of stout spines 3--25 mm. long above each principal internode, the spines often to 6 mm. wide at their base and always very sharp-pointed; twigs slender, mostly unarmed; nodes obscurely or not at all annulate; principal internodes 1--4.8 cm. long; leaf-scars borne on prominent and divergent, stout, corky, glabrate sterigmata 1--3 mm. long; leaves decussate-opposite, persistent; petioles very slender, 4--8 mm. long, subglabrate; leaf-blades firmly chartaceous, dark-green above, lighter beneath, shiny on both surfaces, narrowly oblong or oblong-elliptic to elliptic, 2.7--12 cm. long, 1.5--3.8 cm. wide, rounded or subacute (rarely retuse) at the apex, entire or with a very few tooth-like projections near the apex, cuneately attenuate at the base, usually bearing a pair of small and inconspicuous glands at the base, glabrous or subglabrate above, pulverulent or subglabrate beneath and densely tomentose-barbellate with white hairs in the axils of the secondaries and sometimes along the midrib beneath; midrib very slender, plane or prominulent above, prominent beneath; secondaries slender, 5--7 pairs, ascending, usually not very much arcuate except at their apex, slightly prominulent on both surfaces, obscurely or not at all anastomosing; vein and veinlet reticulation abundant, slightly prominulent on both surfaces, especially above; racemes numerous, terminating the twigs, rarely axillary, 4--13 cm. long, 1--1.7 cm. wide, erect or nutant, many-flowered, simple; peduncles very slender, 5--7 mm. long, strigillose or subglabrate; rachis very slender, strigillose or subglabrate; pedicels obsolete or to 1 mm. long; bracts and bractlets absent; prophylla minute, setaceous; flowers fragrant, subsessile, solitary or pseudo-opposite, with paired ones rarely interspersed; calyx urceolate-campanulate or cyathiform, membranous, slightly 5-nerved, pubescent on both surfaces, about 4 mm. long, the external pubescence short and rather patulous, the rim very variable, irregularly 5-fid or -dentate, the teeth rounded, two of them about 2 mm. long; corolla varying from creamy-white or cream-colored to yellowish, pale-yellow, or yellow, hypocrateriform or obconic-campanulate, externally glabrous, villous (especially in the throat) within, the tube obconic, as long as the calyx, the limb 5-parted, about 6 mm. wide, subregular, the lobes linear or subelliptic, twice as long as wide, patent, very obtuse or rounded at the apex, ciliate-margined; stamens 5, inserted in the corolla-tube beneath the sinuses of the limb, subequal; filaments short or very short; anthers sagittate, erect, reaching the sinuses of the corolla-limb; style short, glabrous, included; stigma emarginate; ovary ovoid, 2-celled, 4-ovulate; fruiting-calyx cupuliform, indurated, about 4 mm. long and 7 mm. wide, ribbed, glabrate, the margin shallowly and irregularly erose or deeply 5-lobed with rounded lobes; fruit fleshy, oblong, varying from red, vivid-red, reddish, or rose-colored to blackish, usually black in drying, about 10 mm. long and 8 mm. wide, glabrous, greatly wrinkled in drying.

The type of this species was collected by Friedrich Sellow at Montevideo, Uruguay, and is deposited in the herbarium of the Botanisches Museum at Berlin. *C. barbinerve* is also based on several collections of Sellow in Uruguay and in Santa Catarina, Brazil ["e provincia Cisplatina nec non e Brasilia tropica misit Sellowius noster"]. Chamisso claimed that the species is related to *C. villosum* Jacq. [=*C. fruticosum* var. *villosum* (Jacq.) O. E. Schulz], *C. molle* H.B.K., and *C. cinereum* L. [=*C. fruticosum* L.], but differing from all of these in the form of the leaves, the barbate vein-axils, and the presence of spines. It inhabits marshy and swampy woods, the margins of forests, and streamsides, ascending from sea-level to 450 m. altitude. It has been collected in anthesis from August to April and in June, and in fruit from January to March and in May.

Parodi, in the 1934 reference cited above, says "Arbol de 5 a 8 m de altura, con hojas persistentes, originario del sur del Brasil, Uruguay y Noreste argentino hasta el Delta paranense. Es muy apropiado para ser cultivado en plazas y paseos; crece muy bien en Buenos Aires. Existe una avenida arbolada con esta especie en el Parque 3 de Febrero, y ejemplares dispersos en otros paseos y plazas de la Capital Federal."

Balansa on his collectio *no. 2095* says that the fruits are red, while on his *no. 3127* that they are black. Briquet points out that this is probably only due to the degree of maturity of the fruit, because the collections are otherwise identical. Rosengurtt reports that the species is a constituent of the riverside woods in Uruguay. Pictures of sterile and fertile twigs are seen in Arechavaleta's paper, cited above. The Fröderström collection listed below consists of seeds only. Dentate leaves are seen on *Herter 94760* in the Britton Herbarium at New York. A splendid photograph of the trunk of this tree is published by Cabrera & Dawson on plate 6, fig. 1, of the 1944 article cited above. These authors describe the bark as "cubierto de corteza de color gris blanquecino agrietada longitudinalmente". According to Doello-Jurado this is the "arbol sin nombre" mentioned by W. H. Hudson in his famous book entitled "Far Away and Long Ago" [Spanish edition, "Allá Lejos y Hace Tiempo", Buenos Aires, 1938] as occurring in the park of Rancho de Hudson. At Punta Lara the tree propagates itself by seeds and also by "raíces gemíferas horizontales".

It is worthy of note that some of the racemes are quite loosely-flowered, while others are very densely-flowered; the flowers on the latter are also much smaller. Archer reports that it produces a very hard lumber. Menninger says that it "should be hardy throughout Florida". He charges $1 for a 12-inch seedling. Besides the cultivated records cited below, the species is reported as being cultivated in France. It has been confused in herbaria with *Vitex montevidensis* Cham. [=*V. megapotamica* (Spreng.) Moldenke], due, undoubtedly, to the similarity in the specific epithet and accredition and not to any remote resemblance between the two plants, *C. spinosum* H.B.K. [=*C. flexuosum* (Ruíz & Pav.) D. Don], *C. myrianthum* Cham., and *C. cinereum* L. [=*C. fruticosum* L.]. Schultz, in the reference cited above, actually adopts *C. cinereum* as the valid name for the plant and gives *C. barbinerve* as a synonym!

Glaziou 9540 is designated on its printed labels as being from the vicinity of Rio de Janeiro, but is cited by the collector himself in the published report on his collections as having been collected at Campos da Bocaina, in the state of São Paulo, Brazil.

Common names reported for the species are "aguay-guazú", "arbol de la sal", "espina de bañado", "espino de los bañados", "naranja de bañado", "naraujillo", "taruma", "tarumá", "tarumá espirudo", "tarumã de espinho", "tarumã-de-espinho", "taruman", "tarumán", "taruman con espinas", "taruman de espina", "taruman espinoso", and "Uruguay fiddlewood". The name "taruman con espinas" is used to differentiate the tree from the "taruman sin espinas", which is *Prunus sphaerocarpa* Sw. The name "taruma" is also applied to members of the genus *Vitex* Tourn. generally and to *V. excelsa* Moldenke specifically, and "tarumá" to *V. cymosa* Bert., *V. duckei* Huber, *V. megapotamica* (Spreng.) Moldenke, *V. pseudolea* Rusby, *V. triflora* Vahl, and *V. triflora* var. *coriacea* Huber, while "taruman" is also applied to *V. duckei*, *V. megapotamica*, *V. flavens* H.B.K., *V. polygama* Cham., and *V. sellowiana* Cham. Herter seems to imply that the "Rauwolfia" species of Larrañaga belong here, and, in a letter received from him by me shortly before his death, he confirms this.

In all, 178 herbarium specimens, including the types of most of the names involved, and 16 mounted photographs have been examined.

Citations: BRAZIL: Minas Gerais: *Warming s.n.* [Lagoa Santo] (Cp). Paraná: *Tweedie s.n.* (K, K, L), Rio Grande do Sul: *Gaudichaud 502* (P), *503* (P), *505* (P); *Henz 29666* (N); *Jürgenz 53* (B); *Malme 359* (S, S), *400* (N, S, Us), *534b* (S, S), *950* (Lu, S); *Rambo 43323* (N); *Reineck & Czermak 494* (P, P); *Saint-Hilaire C^2.1843 ter* (P, P), *C^2.2653 bis* (P, P). Santa Catarina: *Sellow 379* (B, B, B, B, N), *1421* (B, B, B), *1879* [Macbride photos 17591, in part] (B, B, F—663020—photo, Kr—photo, N—photo), *1932* (N), *2310* (B), *s.n.* [Brasil merid.] (B, B—photo, Bm, Dc, K, K—photo, N, N—photo, P, S—photo, V, V, V—285033, Z—photo), *s.n.* [Brasilia; Macbride photos 17591, in part] (F—663020—photo, F—999009, Kr—photo, L, Le, N—photo, S, Us). São Paulo: Glaziou 9540 (B, Br, Cb, Cp, F—538615, Gg—162565, K, L, P); Regnell 276 (Ja—32244). PARAGUAY: Anisits 1872 (S); Balansa 2095 (Cb, K, P, P), 3127 (P, X). URUGUAY: Arechavaleta 39 (Cb, Cb), 42 (Cb, Cb, Cb, Ug, Ug), 280 (Cb, Cb, Cb, Ug), s.n. [flowers; Herb. Osten 3754. in part] (Cp—photo, Cp—photo, Ug), s.n. [fruit; Herb. Osten 3754, in part] (Ug); H. H. Bartlett 21330 (Ca—772374, W—1907624); Berro 801 (N, X); Castellanos s.n. [Herb. Inst. Miguel Lillo 1176] (N); Courbon 220 (P, P); Fruchard s.n. [X.1876] (P), s.n. [1 Jan. 1877] (P, P, P); Gibert 33 (K), 40 (K); Herter 3514 [Herb. Osten 20948] (Ug), 94760 (N), s.n. [Herb. Osten 18988] (Ug); Legrand 508 (F—1004197, Ug), 687 (Ug); Naudin s.n. (A, A); Rosa-Mato 802 (Ug—9805); Schröder s.n. [Herb. Osten 15505] (Ug); Sellow 3185 (B—type, B—isotype, B—isotype, K—photo of type, N—photo of type, P—isotype, S—photo of type, Z—photo of type); Spegazzini s.n. [1892] (Br); Stuckert 8282 (Cb); Tweedie s.n. [Missiones of the Uruguay] (L). ARGENTINA: Buenos Aires: Archer 4580 (W—1691995); Black & Fróes 51-11436 (Z); Cabrera 1916 (N), 1988 (N), 2502 (F—670066, N, N, S, S, W—1574519), 6359 (N, N); Commerson s.n. [Herb. Jussieu 5103] (P); Scala 805 (N), 887 (N), s.n. [Arroyo Tuyuparé; Herb. Inst. Biol. 37394] (N, Sp), s.n. [Paraná Mini] (N, Ug), s.n. [Río Chana] (N, S, Ug). Corrientes: Niederlein 1571 (B); Venturi 433 (N). Entre Ríos: Burkart 8315 (F—900211, N). Isla Martín García: Pastore 275 (N); Perez Moreau s.n. [Herb. Mus. Argent. Cienc. Nat. 7189] (N). Misiones: Bertoni 1888 (N, S), 2654 (N), 5643 (N); Grüner 1218 [Herb. Osten 23184] (N, Ug); Niederlein 509 (B), s.n. [Santa Ana, Loreto] (B); D. Rodriguez 22 [9.XII.1909; Herb. Inst. Miguel Lillo 10005] (N), 22 [11.IX.1912] (N), 440 [Herb. Mus. Argent. Cienc. Nat. 16283] (N), s.n. [Herb. Mus. Argent. Cienc. Nat. 23946] (N). Tucumán: Venturi 4077 (A, N, W—1591432). CULTIVATED: Argentina: Curran 46 (Y); Herb. Jard. Bot. Buenos Aires s.n. [Herb. Argentino] (Ca—202202); Parodi 12248 (N, N), 12249 (N); Troncoso 352 (N), s.n. [26.IX.1936] (N). California: Mrs. A. Blake s.n. [Berkeley, May 20, 1940] (Gg—275970); Bolton s.n. [Hueneme, Sept. 1924] (Gg—34492); Eastwood s.n. [Hueneme, April 18, 1916] (Gg—31074), s.n. [Montecito, Nov. 8, 1923] (Gg—31065); Herb. Calif. Acad. Sci. 162167 (Gg); R. Moran 2655 (Ba); Walther s.n. [San Francisco, Dec. 1919] (Gg—31066), s.n. [San Francisco, July 9, 1920] (Gg—31067). India: Raizada s.n. [New Forest, Dehra Dun, April 1937] (N). Uruguay: Fröderström s.n. [Jardin Botanico, Montevideo, 1939] (S). LOCALITY OF COLLECTION UNDESIGNATED: Bonpland s.n. (P); Collector undesignated s.n. (Ug, Ug, Ug, Ug, Ug); Gructum s.n. [Juni 1877] (B); Leguerré s.n. (P, P).

CITHAREXYLUM MUCRONATUM Fourn. & Moldenke ex Moldenke in Fedde, Repert. 37: 232. 1934.

Synonymy: Citharexylon mucronatum Fourn. ex Moldenke, Prelim. Alph. List Invalid Names 15, in syn. 1940.

Literature: Moldenke in Fedde, Repert. 37: 232. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 16. 1939; Moldenke, Prelim. Alph. List Invalid Names 15. 1940; Moldenke, Alph. List Invalid Names 13. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 22 & 88. 1942; Moldenke, Alph. List Cit. 2: 337 & 349 (1948) and 3: 658 & 694. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 38 & 179. 1949.

Shrub or tree; branchlets and twigs slender, light-brown, ribbed, rather sharply tetragonal, subglabrate; nodes not annulate; principal internodes 1.4--2.5 cm. long; leaf-scars borne on very short ascending sterigmata 1--2 mm. long; leaves decussate-opposite or subopposite; petioles slender, 7--10 mm. long, glabrous; leaf-blades chartaceous, rather uniformly dark-green on both surfaces, very narrowly oblong, 7--12 cm. long, 1.7--2.3 cm. wide, rounded to a cucullate and mucronate apex, entire, cuneately narrowed at the base, pronouncedly revolute for a short distance at the base and there bearing a pair of elongated glands which are completely hidden by the inrolled margins, glabrate and densely impressed-punctate on both surfaces; midrib slender, prominent on both surfaces; secondaries very slender, 4 or 5 pairs, distant, short, arcuate-ascending, not anastomosing, prominulent beneath; vein and veinlet reticulation sparse, mostly obscure; racemes terminal, elongate, 15--22 cm. long, about 1 cm. wide, erect or nutant, extremely densely many-flowered, simple; peduncles slender, brown, 5--15 mm. long, glabrate; rachis slender, glabrate; pedicels very slender, 1--1.5 mm. long, glabrous; bracts and bractlets absent; prophylla linear, 1--2 mm. long; calyx campanulate, about 2.6 mm. long and wide, 5-costate, glabrate, the margin very shortly 5-apiculate or subentire; corolla (in bud) small, its tube broadly cylindric, about 2 mm. long, externally minutely puberulent, densely pilose in the throat within, the limb 5-parted, the lobes ovate-lingulate, variable in size, about 1.5 mm. long and 1.3 mm. wide, rounded at the apex; fertile stamens 4, subequal, inserted about 1 mm. below the mouth of the corolla-tube, included; filaments about 0.5 mm. long; anthers oblong-ovate, about 1.3 mm. long and 0.6 mm. wide; staminode small, about 0.2 mm. long; pistil included; style about 1.1 mm. long; stigma very shortly 2-lobed, about 0.5 mm. long; ovary obovate, about 0.7 mm. long and wide, glabrous; fruiting-calyx and fruit not known.

The type of this species was collected by Paul Lévy (no. 471) in a forest at Chontales, at an altitude of 600 meters, in the province of Chontales, Nicaragua, in June, 1870, and is deposited in the herbarium of the Musén National d'Histoire Naturelle at Paris. Thus far, it is known only from the type collection. In all, 7 herbarium specimens, including the type, and 9 mounted photographs have been examined.

Citations: NICARAGUA: Chontales: Lévy 471 [Macbride photos

28396] (B—photo of type, Cb—isotype, F—830268—photo of isotype, F—998913—isotype, K—photo of type, Kr—photo of isotype, N—isotype, N—photo of type, N—photo of isotype, N—photo of type, P—type, P—isotype, P—isotype, S—photo of type, X—isotype, Z—photo of type).

CITHAREXYLUM MYRIANTHUM Cham., Linnaea 7: 117—119. 1832.

Synonymy: *Citharexylum scabrum* Willd. ex Cham., Linnaea 7: 117, in syn. 1832 [not *C. scabrum* Sessé & Moc., 1831]. *Citharexylon myrianthum* Cham. apud Walp., Repert. 4: 77. 1845. *Citharexylon scabrum* Willd. apud Walp., Repert. 4: 77, in syn. 1845. *Citharexylon cinereum* Spreng. ex Schau. in Mart., Fl. Bras. 9: 269, in syn. 1851 [not *C. cinereum* L., 1763, nor *Citharexylum cinereum* L., 1767, nor *Citharexylum cinereum* Sessé & Moc., 1831, nor *Citharexylum cinereum* Jacq., 1909]. *Citharexylum cinereum* Spreng. apud Jacks., Ind. Kew. 1: 549, in syn. 1893. *Citharexylum myrianthum* var. *acuminatum* Briq., Ann. Conserv. & Jard. Bot. Genèv. 7—8: 317. 1904. *Citharexylon macranthum* Hayek in Engl., Bot. Jahrb. 42: 170. 1908 [not *Citharexylum macranthum* Pittier, 1916]. *Citharexylum macranthum* Hayek apud Prain, Ind. Kew. Suppl. 4: 49. 1913. *Citharexylum myrianthum* Walp. ex Moldenke, Prelim. Alph. List Invalid Names 17, in syn. 1940. *Citharexylum myrianthum* var. *macranthum* (Hayek) Hassler ex Moldenke, Prelim. Alph. List Invalid Names 17, in syn. 1940. *Citharexylum plumieri* Otto ex Moldenke, Prelim. Alph. List Invalid Names 17, in syn. 1940 [not *Citharexylon plumerii* Plum., 1947]. *Citharexylum myrianthemum* Cham. ex Raimondi, Bol. Mus. Hist. Nat. Jav. Prado 7: 245, sphalm. 1943. *Citharexylum mirianthum* Cham. ex Moldenke, Alph. List Invalid Names Suppl. 1: 5, in syn. 1947. *Cithareelum myrianthum* Cham. ex Moldenke, Alph. List Cit. 4: 1066, sphalm. 1949. *Citarexilon myrianthum* Cham. apud Angely, Fl. Parana 11: 31. 1957. *Citharexylum myrianthum* var. *obtusifolia* Mart., in herb.

Literature: Cham., Linnaea 7: 117—119. 1832; Walp., Repert. 4: 77. 1845; Schau. in A. DC., Prodr. 11: 612. 1847; Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 198. 1892; Jacks., Ind. Kew. 1: 549. 1893; Chod., Bull. Herb. Boiss., sér. 2, 2: 821 [Plant. Hassler. 200]. 1902; Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1166 [Plant. Hassler. 502]. 1904;Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 317. 1904; Hayek in Engl., Bot. Jahrb. 42: 170. 1908; Glaz., Bull. Bot. Soc. France Mém. 3: 546. 1911; Prain, Ind. Kew. Suppl. 4: 49. 1913; Molfino, Physis 7: 102. 1923; Latzina, Trab. Inst. Bot. & Farm. 54: 78. 1935; Latzina, Lilloa 1: 188. 1937; Moldenke, Alph. List Common Names 7, 25, 27, & 31. 1939; Moldenke, Geogr. Distrib. Avicenn. 25, 28, 29, & 36. 1939; Herter, Revist. Sudam. Bot. 6: 97. 1939; Moldenke, Prelim. Alph. List Invalid Names 15 & 17. 1940; Hoehne, Kuhlmann, & Handro, O Jard. Bot. S. Paulo 577. 1941; Moldenke, Lilloa 6: 318—319. 1941; Kuhlmann, Inst. Bot. Observ. Ger. Contrib. 5: 19 & II. 1942; Moldenke, Alph. List Invalid Names 13--15. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 36, 40, 43, 71, & 88. 1942; Moldenke, Lilloa 8: 414. 1942; Raimondi, Bol. Mus. Hist. Nat. Jav. Prado 7: 245. 1943; Moldenke, Phytologia 2: 97. 1944; Augusto, Fl. Rio Grande do Sul 236. 1946; Moldenke, Alph. List Cit. 1: 9, 11, 27, 56, 136, 170, 171, 184, 192, 200, 201, 237, 263, 265, 270, 273, 274, 289, 298, & 309. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 5. 1947; Kuhlmann & Kühn, Flor. Dist. Ibiti 116 & 180. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 76. 1948; Moldenke, Alph. List Cit. 2: 328, 329, 332, 333, 343, 361--363, 365, 369, 370, 372, 409, 413, 420, 424--428, 431, 445, 459, 529, 534, 550--552, 599, & 619 (1948), 3: 670, 684, 690, 703, 704, 710, 736, 745, 749, 751, 783, 784, 816, 855, 856, 862, 892, 900, 920, & 923 (1949), and 4: 1013, 1020, 1040, 1044, 1049, 1062, 1066, 1094, 1123, 1236, 1287, & 1301. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76, 98, 103, 157, & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Moldenke, Phytologia 3: 287. 1950; Stellfeld, Trib. Farmac. 19 (10): 169. 1951; Moldenke, Inform. Set 48 Spec. [2]. 1954; Rambo, Sellowia 6: 60, 84, & 153. 1954.

Fine majestic tree or shrub, 3--15 m. tall; trunk to 30 cm. in diameter; bark smooth and flat, lacerated, from dark or gray to yellow; branches and branchlets unarmed, subscabrid, medium-stout, strong, woody, stramineous, shiny, very obtusely 4--6-angled or subterete, rarely acutely tetragonal, glabrate, the branches usually divaricate and more or less angular, the branchlets often subternate or ternate, tetragonal, often 4-carinate; twigs slender, chestnut-brown, often ternate or alternate, more or less tetragonal and sulcate, minutely strigillose or glabrate; nodes usually not annulate or annulate only when the leaves are strictly opposite; principal internodes 1--8 cm. long; leaf-scars borne on short, stout, corky, appressed sterigmata 1--4 mm. long; leaves decussate-opposite, but very often varying from subopposite or approximate to scattered, subternate, ternate, subalternate, or even alternate both on young shoots and on older wood (!); petioles slender, 1--2.1 cm. long, flattened above, glabrate; leaf-blades chartaceous or coriaceous, bright-green, lighter beneath, elliptic or elliptic-lanceolate to oblong-elliptic or oblong, varying to obovate, 3.5--16.7 cm. long, 2--7 cm. wide, obtuse (rarely retuse) or acute to subacuminate or acuminate at the apex, the acumen itself often rounded, entire, acute or cuneate at the base and somewhat prolonged into the petiole, bearing 1 or 2 more or less elongate (often greatly enlarged) pelviform glands close to the midrib on this basal prolongation, shiny and glabrous or subglabrate (or scabridous) above (except for the more or less strigillose midrib), minutely scabridous-strigillose or lightly hirtellous on the larger venation beneath; midrib slender, plane above, prominent beneath; secondaries slender, 4--11 pairs, obliquely ascending, often not very arcuate, sometimes anastomosing at the margins beneath but often hardly or not at all doing so, plane above, prominulent beneath; vein and veinlet reticulation abundant, plane above, noticeably prominulent beneath; racemes axillary and terminal, simple, but often crowded in paniculiform manner, mostly erect, sometimes nutant, 6.5—20 cm. long, to 3.5 cm. wide in anthesis, many-flowered; peduncles rather slender, chestnut-brown, 1—4 cm. long, minutely strigillose, often bearing 1 or more irregularly spaced nodes with or without buds and bracts or bractlets; rachis slender, angulate, striate, brown, varying from strigillose or densely puberulent to lightly hirtellous or short-pubescent; pedicels slender, to 3 mm. long, densely short-pubescent; bracts often present, foliaceous, resembling the leaves in all respects but usually smaller; bractlets often present, scattered, very variable in size and shape, usually linear or linear-lanceolate to very narrowly oblong, 1—2 cm. long; prophylla scale-like or linear-setaceous, minute, acute, pubescent, shorter than the pedicels; flowers subsessile or pedicellate, nutant, often alternate, sparse, fragrant, often secund or subsecund during anthesis; calyx subcylindric-cyathiform or urceolate-obconic, membranous, herbaceous-banded, about 5 mm. long, obtuse at the base, 5-nerved, strigillose-pubescent and ciliate, minutely tuberculate toward the base outside, its rim rather irregularly, 5- or 6-dentate with obtuse or rounded teeth, or often bilabiate with the upper lip 3-parted and the lower bifid; corolla long-tubular or subhypocrateriform, varying from white or cream-colored to whitish-rose or yellowish, 15—19 mm. long, 3—4 times as long as the calyx, its tube usually cream-colored toward the apex and green or greenish toward the base, narrow, puberulent in the throat or lightly lanuginous above the stamens within, otherwise glabrous, the limb usually white, patulous, bilobed, 5-parted, externally glabrous, the lobes equal, patent, about 5 mm. long, broadly obovate; fertile stamens 4, inserted in the lower part of the corolla-tube, equaling the calyx, not plainly didynamous; staminode slightly smaller, inserted lower than the stamens; filaments shorter than the erect linear anthers; style almost equaling the calyx; stigma brown, incrassate, emarginate; fruiting-calyx cupuliform, indurated, about 4 mm. long and 7 mm. wide, glabrate, its rim deeply and irregularly 5-lobed with acute triangular lobes; fruit oblong or obovate, about 10 mm. long, 7—8 mm. wide when mature, not very or not at all fleshy, red or scarlet when fresh, light-brown in drying, glabrous, 2-sulcate, 2-seeded.

The species was based on several collections made by Friedrich Sellow (*nos. 550* and *650* and *s.n.*) in Bahia, Brazil, probably all near Nazaré, and deposited in the herbarium of the Botanisches Museum at Berlin. Most of the cotype specimens are only in bud and therefore do not show the size attained by the flowers when in full anthesis. There is, however, one sheet which exhibits well both the immature and the mature flowers. The type of *C. scabrum* Willd. is *Herb. Willdenow 11475* from the Link herbarium. *C. macranthum* Hayek is based on *K. Fiebrig 596*, collected at the edge of woods by a wet campo at Cordillera de Altos, Paraguay, on December 12, 1902, deposited in the Berlin herbarium. Unfortunately the entire *Verbenaceae* section of the Berlin herbarium was destroyed by fire during World War II, so that these type and cotype specimens, and hundreds of other specimens cited by me in my monographs as being in this herbarium, are now non-existent. I luckily examined them in the years prior to World War II, and I have since examined and annotated all the new material of this family acquisitioned since the war.

The type of *C. myrianthum* var. *acuminatum* is *Balansa 2090a*, collected at Borja, between Villa-Rica and Caaguazu, Paraguay, in November, 1874, and deposited in the Delessert Herbarium at Geneva. Briquet states that this variety differs from the typical form of the species in having the leaf-blades regularly acuminate at the apex, the acumen itself obtuse at its tip. However, careful comparison of the material with the wealth of other material available fails to reveal any constant characters by which the so-called variety may be maintained. The same is true of Hayek's *C. macranthum*, which Hassler reduced to varietal rank.

C. myrianthum var. *obtusifolia* seems to be based on *Martius 413* in the Munich herbarium. A sheet formerly in the Sprengel herbarium at Berlin bore the annotation "*Citharexylon Plumerii** Plum. ic. t. 157, f. 2. ? P. Brown. jam. t. 28, f. 2". These two cited illustrations, however, plainly represent *C. caudatum* L. and have nothing to do with *C. myrianthum*.

The venation on the lower leaf-surfaces of *C. myrianthum* is quite distinct and conspicuous, but usually is not at all so on the upper surface. The remarkable frequence of scattered, ternate, or subalternate leaves and branchlets or twigs is most noteworthy. The flowers are among the largest known in the genus. It has been collected in anthesis from October to March, and in fruit in December and January, growing at altitudes of 2 to 900 meters. Collectors have found it in wet places, in the vicinity of lakes and streams, in wet or mountainous woods or wooded swamps, and at the edge of primeval forests. Jörgensen reports it as "common in humid thickets", Anisits says it occurs in wet meadows, and Pedersen found it on wet ground in thickets by small streams. It is especially abundant in the Organ Mountains of Rio de Janeiro. Tweedie describes it as a "fine majestic tree with fine clusters of red berries found in moist places in woods of S. Brazil". Hoehne refers to it as an "arvore grande". Endlich says that it is quite common in moist places among fields and woods, its red fruit rendering it quite conspicuous from a distance; its wood being of medium value. Kuhlmann & Kühn classify it as a helohylophyte. Hatschbach found it on an alluvial plateau, and Costa reports it from mata. Dusén says it grows "in locis apertis" along railroad tracks, and Kuhlmann states that it is an "arvore comum em terrenos úmidos das baixadas."

It has been confused with and misidentified in herbaria as *C. barbinerve* Cham., *C. cinereum* L., *C. quadrangulare* L., *C. solanaceum* Cham., "*C. 4-angulare* L.", *C. myrianthum* var. *rigid-*

um Briq., and Cordia sp. Briquet's var. rigidum is regarded as a distinct species by me.

The Glaziou 13058 and 13059 cited as C. myrianthum by Glaziou in the reference listed above are actually C. glaziovii Moldenke, which see, while his 9989, cited by him as C. quadrangulare Jacq., is the true C. myrianthum. He states that the latter was cultivated at Quinta da Boa Vista, Rio de Janeiro. The Raimondi 12501 identified as "Citharexylum cfr. myrianthemum Cham." in Bol. Mus. Hist. Nat. Jav. Prado 7: 245 (1943) has not been seen by me, but is probably not this species. It was collected on "pampa hermosa" in the Montaña del Pangoa, province of Jauja, Junín, Peru. The D. A. Lima s.n. from Pernambuco, cited below, may be from cultivated material, but the labels do not indicate this. The M. Kuhlmann s.n. [18/2/1946], cited below, consists only of seeds.

Kuhlmann & Kühn, in their Flor. Dist. Ibiti 180 (1947), mention the common names "pau de viola" and "pimenteira", and then continue as follows: "O nome grego desta planta, traduzido para o vernáculo, corresponde ao primeiro nome popular indicado, acrescido do qualificativo correspondente a 'plurifloro' ou, melhor ainda, 'miríades de flores'. De fato, esta planta, comum nos terrenos úmidos, cobre-se de milhares de flores alvas, às vezes levemente róseas, dispostas em cimas secundifloras, axilares ou terminais, entre Novembro e Dezembro, as quais, depois de saciarem de pólen e nectar as 'Abelhas' e outros Insetos que as visitam, se desenvolvem em frutos drupóides, oval-oblongados, de coloração alaranjada até vermelha, um tanto parecidos com certas variedades de 'Pimenta'. Dizem que as 'Pombas' comem êstes frutos e, poe isto, a árvore de madeira leve e ressonante, própria para instrumentos de corda, recebe também em alguns lugares o nome de 'Pombeira'".

Common names recorded for the species are "caá voró", "carvoeiro", "fruta de macaco", "jacatauba", "pau de viola", "pimenteira", "pirazú rembiú", "pombeiro", "primenteira", "sarriá", "tarumã", "tombeiro", "tupacý-mboý", "tucaneira", "tucaneiro", "turuman", and "zará". In all, 263 herbarium specimens, including the types of all the names involved, and 20 mounted photographs and clippings have been examined.

Citations: BRAZIL: Bahia: Pirajá da Silva 15 (N, Sp--39338); L. Riedel s.n. [pr. Ilheos, Dec. 1823] (L, L, L); Sellow 550 (B--cotype, B--cotype), 650 [Macbride photos 17597] (B--cotype, B--cotype, F--663026--photo of cotype, Kr--photo of cotype, N--photo of cotype), s.n. [Nazaré, prope Bahia] (B--cotype, B--cotype, B--cotype, B--cotype, B--cotype, Dc--cotype, K--photo of cotype, L--cotype, N--photo of cotype, S--photo of cotype, Z--photo of cotype). Minas Gerais: Mello Barreto 10396 [Herb. Jard. Bot. Belo Horiz. 30269] (N); Miers s.n. (Bm). Paraná: Dusén 7462 (Ca--501682, D--683014, E--1035823, F--668417, G, K, Lu, S, W--1481818), 7018 (N, S, W--1481816), 8850 (B, Cb, E--1035820, G, I, S), 14595 (B, E--908055, G, N, S, S, W--1481817); Hatschbach 1653 (N). Pernambuco: D. A. Lima s.n. [Estrada Dois Irmãos, Recife]

(Be--52402, Be--52402a). Rio de Janeiro: Andersson s.n. [1857] (S); Glaziou 11318 (B, Br, Cb, Cp, K, L, N, P, P, P); Luschnath s.n. (B); Martius 340 (Mu--751); Miers 4588 (K), 4590 (K); L. Riedel s.n. [pr. Mand. 1-3. 1823] (L); Sampaio s.n. [Guaratiba; Herb. Rio de Jan. 25741] (N), s.n. [Campos; Herb. Rio de Jan. 31549] (N); Schenck 2560 (B); Widgren 1195 (S, S). Rio Grande do Sul: Emrich 11264 (Rb); Henz 32681 (N); Malme 402 (S, S), 780 (S, S); Moldenke & Moldenke 19686 (Lg, N); Rambo 1078 (N, S), 30606 (Rb), s.n. [27.XI.1945] (S); Thering 174 (B); Tweedie s.n. [woods of Lagoa de los Patos] (K). Santa Catarina: Eq. Ecologia 150 (Le); Gevieski 56 [H. B. R. 8381] (Cb, N); Klein 866 (Sm), 2195 (Sm); Reitz 4191 [Herb. Reitz 4749] (Le, S), C.1768 (N, S); Reitz & Klein 1184 [H. B. R. 8376] (N, Z), 2697 (Sm), 5803 (Z). São Paulo: Brade 5790 (S); A. P. D. Costa 2012 (N, Sf); Heiner 342 (S); F. C. Hoehne s.n. [Itú] (K, K, N, Sp--31426), s.n. [Santos] (K, Sp--29949), s.n. (N, Sp--887, Sp--28578); Koscinsky s.n. (K, Sp--30050); M. Kuhlmann s.n. [18/2/1946] (N, Sp); Leite 3684 (El); Löfgren s.n. [Herv. Geogr. & Geol. S. Paulo 4219] (G, N, Sp--15628); Löfgren & Edwall s.n. [Herv. Geogr. & Geol. S. Paulo 2816] (N, Sp--15630); Moldenke & Moldenke 19627 (N); Mosén 3033 (S, S, S, S, S), s.n. [Santos] (P); Viégas & Kiehl s.n. [Herb. Inst. Agron. Est. S. Paulo 3863] (Sp--42020). State undetermined: Helmenreich 38 (B, B, N, V, V); Herb. Imp. Vien. 146 (K); Herb. Martius 413 (B, B, Br, Cb, E--119105, K, Le, M, Mu--753); Herb. Persoon s.n. (Le); Herb. Willdenow 11475 [ex herb. Link] (B, K--photo, N--photo, S--photo, Z--photo); Martius s.n. (Mu--752); Otto s.n. (B); Riedel & Langsdorff 121 (L); Riedel & Luschnath 121 (L); Widgren 733 (S). PARAGUAY: Anisits 6 (S); Balansa 2090a (Br, Cb, Cb, K, L, P, S, X); Endlich 207 (B); Fiebrig 596 [Macbride photos 17596] (B, B, Cb, Ed, F--222155, F--663025--photo, K, K--photo, Kr--photo, N, N--photo, N--photo, S-photo, Z--photo), 6323 (B, Bm, Cb, Cb, G, K, Sp--33506, W--1178003); Hassler 1263a (Bm), 1363 (Bm, K, N, N, N, P, X, X), 1363a (K, P, X), 3590 (A, Bm, Cb, Cb, F--686678, K, N, P, V--2184, X), 5457 (A, B, Bm, Ca--944322, Cb, K, K, N, P, P, S, V--3184, X), 12366 (A, A, B, Bm, Cb, Cp, E--848249, Ed, F--689784, G, K, Le, N, W--1057310), 12942 (Bm, Ed); Jörgensen 3688 [Herb. Osten 22246] (Cp, D--653292, D--690508, Du--185415, E--971984, E--1006176, F--696895, P, S, Ug, W--1483798); Morong 830 (Bm, C, D, E--119104, Ed, F--18062, G, K, Mi, Ug, W--57340, W--1416860, X); Pedersen 3163 (S); T. Rojas 1876 [Herb. Hort. Parag. 10442; Herb. Osten 13565] (Ug). ARGENTINA: Misiones: Curran 30 (N, W--920549); Ekman 1440 (S); D. Rodriguez 145 [Herb. Inst. Miguel Lillo 10000] (N). CULTIVATED: Brazil: Glaziou 9989 (Cp, K, P); F. C. Hoehne, pl. viv. 168 [Herb. Inst. Biol. S. Paulo 28578] (Es, F--895340, N, N, Qu); W. Hoehne 1339 (N);

Pava Coelho 2374 (N, Sf). MOUNTED CLIPPINGS: Cham., Linnaea 7: 117--119. 1832 (B).

CITHAREXYLUM OBTUSIFOLIUM Kuhlmann, Arquiv. Inst. Biol. Veg. Rio Jan. 3 (1): 48, pl. 6. 1936.

Synonymy: Cytarexylum obtusifolium Kuhlmann apud Occhioni, Lilloa 17: 484. 1949.

Literature: Kuhlmann, Arquiv. Inst. Biol. Veg. Rio Jan. 3 (1): 48, pl. 6. 1936; Moldenke, Geogr. Distrib. Avicenn. 25. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 36 & 88. 1942; Salisb., Ind. Kew. Suppl. 10: 53. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76 & 179. 1949; Occhioni, Lilloa 17: 484. 1949.

Illustrations: Kuhlmann, Arquiv. Inst. Biol. Veg. Rio Jan. 3 (1): pl. 6. 1936.

Tree, 10--15 m. tall; branches nodose, cinerascent; leaves alternate; petioles 2--4 cm. long; leaf-blades oblong-elliptic, 10--15 cm. long, rather obtuse at the apex, entire, attenuate into the petiole at the base, loosely reticulate, 2-glanduliferous at the base, glabrous; secondaries 5 or 6, distant, arcuate-ascending, the lowest running along the margins for a long distance; inflorescence terminal, racemose, pedunculate, about 15 cm. long, glabrous; flowers not known; fruiting-pedicels very short; fruiting-calyx about 1.5 cm. wide, patent, its rim crenate-dentate; fruit drupaceous, globose, about 2 cm. long and wide, glabrous; pyrenes 2-celled, concave within, 2-keeled longitudinally in the concavity.

The type of this very puzzling species was collected by João Geraldo Kuhlmann (no. 123) in the primeval forest near Goutacazes, Espirito Santo, Brazil, on March 31, 1934, and is no. 28901 in the herbarium of the Jardim Botanico at Rio de Janeiro. Unfortunately, I have not been able to examine the type specimen as yet.

CITHAREXYLUM OLEINUM (Benth.) Moldenke in Fedde, Repert. 42: 248. 1937.

Synonymy: Scleroon oleinum Benth. in Lindl., Bot. Reg. 29: misc. 65--66. 1843. Petitia oleina (Benth.) Benth. & Hook. f. ex Hemsl., Biol. Cent.-Am. Bot. 2: 539. 1882. Citharexylum grenzebachianum Moldenke in Fedde, Repert. 37: 226. 1934. Petitia oleina (Benth.) Benth. & Hook. ex Moldenke, Prelim. Alph. List Invalid Names 33, in syn. 1940.

Literature: Benth. in Lindl., Bot. Reg. 29: misc. 65--66. 1843; Hemsl., Biol. Cent.-Am. Bot. 2: 539. 1882; Jacks., Ind. Kew. 2: 477 (1894) and 848. 1895; Moldenke in Fedde, Repert. 37: 226 (1934) and 42: 248. 1937; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Prelim. Alph. List Invalid Names 16, 33, & 40. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16, 71, & 88. 1942; Moldenke, Alph. List Invalid Names 14, 34, & 40. 1942; Moldenke, Alph. List Cit. 1: 313 & 314. 1946; Salisb., Ind. Kew. Suppl. 10: 53. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 83. 1948; Moldenke, Alph. List Cit. 2: 419, 424, 499, 500, & 566 (1948), 3: 834 (1949) and 4: 1028 & 1038. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29, 158, & 179. 1949; Moldenke, Phytologia 3: 375. 1950.

Low branched shrub, to 1 m. tall, forming clumps; branches medium, subterete, with very small pith; branchlets slender, subterete, gray, glabrate or obscurely incanous; twigs and young shoots very slender, gray, subterete or obsoletely tetragonal, very minutely or obsoletely canescent, leafy; nodes not annulate; principal internodes 0.5--3.7 cm. long, mostly greatly abbreviated on leaf- and flower-bearing twigs; leaf-scars practically sessile; leaves decussate-opposite or subopposite, numerous on young shoots; petioles slender, 1.5--5 mm. long, densely appressed-canescent (appearing subglabrate at first glance); leaf-blades firmly chartaceous, rather uniformly dark-green on both surfaces, oblanceolate, 2.5--8.5 cm. long, 0.7--2.8 cm. wide, acute at the apex, entire (and often subrevolute on narrower leaves) along the margins, cuneate at the base and prolonged into the petiole, glabrous on both surfaces; midrib very slender, plane or subimpressed above, prominulent beneath; secondaries 4--7 pairs, often very obscure, ascending, not very much arcuate; vein and veinlet reticulation indiscernible on both surfaces; racemes greatly abbreviated, axillary, abundant, 1--3-flowered, canescent; peduncles very slender, to 6 mm. long, canescent; pedicels slender, 1--3 mm. long, canescent; prophylla setaceous; bracts and bractlets usally absent; calyx campanulate, about 3.1 mm. long and 2 mm. wide, densely white-puberulent, its rim subtruncate and subapiculate or deeply 5-lobed; corolla infundibular, white, densely white-puberulent throughout externally, its tube about 3.6 mm. long, about 2 mm. wide at the base, to 3.6 mm. wide at the apex, densely pilose within at the throat, the limb 3--5-lobed, the lobes ovate, about 1.8 mm. long and 2.3 mm. wide, rounded at the apex; stamens 4, subequal, included, inserted about 1.5 mm. below the mouth of the corolla-tube; filaments about 1 mm. long; anthers oblong, about 1.3 mm. long and 0.7 mm. wide; pistil included; style rather thick, about 0.7 mm. long, glabrous; stigma very shortly 2-lobed, about 0.5 mm. long; ovary subglobose, about 1 mm. long and wide, glabrous; fruiting-calyx shallowly cupuliform or patelliform, about 2.5 mm. long, 4.5--5 mm. wide, glabrate or canescent; fruit subglobose or oblong, to 7 mm. long and 6 mm. wide, black when ripe, rather fleshy with a softm thin, orange pulp, 2-lobed; pyrenes brownish.

The type of this species is a specimen taken from a plant cultivated in the garden of the Royal Horticultural Society in London, England, in 1844, and deposited in the herbarium of the Royal Botanic Gardens at Kew. The original name for the species was published in 1843, the year before the type was collected, so its description was apparently taken from the living plant or from the specimen collected in 1841 and also deposited in the Kew herbarium. The type of C. grenzebachianum was collected by Carl

Albert Purpus (*no. 5337*) at Bagre, San Luis Potosí, Mexico, in May, 1911, and is deposited in the Britton Herbarium at the New York Botanical Garden. It was named in honor of Myrle Eunice Grenzebach [Mrs. Lawrence Dewey Sherod], monographer of the genus *Bouchea* Cham.

The species has often been confused with *C. tetramerum* T. S. Brandeg. by herbarium workers, with which it has many points of similarity. Its very canescent flower-buds and unopened corollas are noteworthy. It has been collected in anthesis in May and September, and in fruit in September and November. Moore found it growing at an altitude of 2300 meters in Hidalgo. In all, 32 herbarium specimens, including the types of all the names involved, and 7 mounted photographs have been examined.

Citations: MEXICO: Hidalgo: *H. E. Moore 5061* (N); *Purpus 6516* (B, Ca--168470, E--825465). San Luis Potosí: *Purpus 4903* (B, Bm, Ca--149030, E--119067, F--344366, G, W--842142), *5025* (Ca--153341, Cb, Cb), *5337* (B, B--photo, Bm, Ca--157426, E--119066, Ed, F--299068, G, K--photo, Me, N, N--photo, S--photo, W--463884, Z--photo), *5341* (B, Ca--157394, Cb, Cb, Ed, N--photo, P, Z--photo). CULTIVATED: England: *Herb. Hort. Soc. London s.n.* [1841] (K), *s. n.* [1844] (K--type).

CITHAREXYLUM OVATIFOLIUM Greenm., Proc. Am. Acad. 32: 301. 1897.

Literature: Greenm., Proc. Am. Acad. 32: 301. 1897; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 43. 1904; Moldenke, Geogr. Distrib. Avicenn. 13. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16 & 88. 1942; Moldenke, Alph. List Cit. 1: 299 (1946), 2: 342, 393, 419, 436, 437, 447, 499, & 540 (1948), 3: 830, 831, 849, & 872 (1949), and 4: 1023, 1028, 1040, & 1057. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29 & 179. 1949.

Soft woody shrub or tree, to 4 m. tall; branches tetragonal, minutely striate; branchlets and twigs slender, sharply tetragonal, medullose, densely pubescent with incanous hairs; nodes mostly contracted, annulate; principal internodes 3--8.3 cm. long; leaf-scars borne on slender, divergent, densely pubescent sterigmata 1--3 mm. long; leaves decussate-opposite; petioles slender, 5--19 mm. long, densely pubescent, often more or less winged above; leaf-blades membranous, dark-green above, slightly paler or much lighter beneath, ovate or ovoid, 3.5--12.5 cm. long, 1.5--6.5 cm. wide, acuminate or obtuse and submucronate at the apex, sparsely and rather irregularly crenate-dentate with blunt and appressed teeth along the margins except at the base and on the acumination (the smaller and immature leaves mostly entire), ciliate, broadly rounded at the base except for a very short triangular prolongation into the petiole, usually with 1 or more large glands on the lower surface at the base of the blade on either side of the midrib or else not glanduliferous, incanous-pubescent on both surfaces, especially along the venation, more densely so beneath; midrib very slender, prominulent beneath; secondaries very slender, 5 or 6 pairs, ascending, mostly not arcuate, prominulent beneath; vein and veinlet reticulation very slender, abundant, very slightly prominulent on both surfaces and conspicuous by its pubescence; racemes axillary and terminal, erect or nutant, simple, spike-like, 5--12 cm. long, about 1 cm. wide, many-flowered, usually terminating the branches and branchlets; peduncles and rachis very slender, densely incanous-pubescent, the former 1--2.5 cm. long and sometimes nodose and bracteolate; pedicels very slender, 1 mm. long or less, densely white-pubescent; bractlets few, linear, white-pubescent; prophylla linear-subulate or subulate, incanous, 1--2 mm. long; calyx about 3 mm. long, 5-nerved and somewhat 5-angled, externally pubescent, its rim subtruncate or minutely and irregularly 5-dentate, ciliate; corolla tubular, about 7 mm. long, white, its tube broad, about 4 mm. long, externally glabrous, densely pilose-pubescent in the throat, the limb 5-lobed, the lobes subrotund, glabrous on both surfaces but strongly ciliate; style glabrous; fruiting-calyx shallowly cupuliform, indurated, about 3 mm. long and 6 mm. wide, puberulent or glabrous, its rim truncate and subentire; fruit oblong, about 8 mm. long and 5 mm. wide, fleshy, shiny, black and wrinkled in drying, 2-sulcate in drying.

The type of this species was collected by Cyrus Guernsey Pringle (*no. 6540*) in a wet wooded barranca above Cuernavaca, Morelos, Mexico, at an altitude of 6500 feet, in August or September, 1896, and is deposited in the Gray Herbarium of Harvard University. It was collected again at the type locality in November, 1902. Its branchlets and twigs are mostly slightly contracted at the nodes. Its ovoid leaf-blades, taken in connection with the incanous pubescence, acutely tetragonal stems, and contracted nodes, serve well to distinguish this species. It has, however, been confused by herbarium workers with *C. sessaei* D. Don, which it closely resembles. Rose and Painter found the species at El Parque, Morelos, in September, 1903, and Reko encountered it at Pueblo Nuevo, Oaxaca, on August 16, 1917. It has been found at altitudes of 1500 to 2500 meters, blooming in August, September, and December, and in fruit in December. *Hinton 2896* is described on the labels as a "vine". In all, 39 herbarium specimens, including the type, and 5 mounted photographs have been examined.

Citations: MEXICO: México: *Hinton 2896* (F--879165, K, K). Morelos: *Pringle 6540* (B--isotype, B--photo of type, Bm--isotype, Br--isotype, C--isotype, Ca--104986--isotype, Cb--isotype, Cm--isotype, E--119056--isotype, Ed--isotype, F--49477--isotype, G--type, Gg--152310--isotype, Io--38743--isotype, J--isotype, K--isotype, K--photo of isotype, L--isotype, Me--isotype, Me--isotype, Me--isotype, Mu--1826--isotype, N--isotype, N--photo of type, P--isotype, P--isotype, S--isotype, S--photo of type, V--4191--isotype, Vt--isotype, Vu--isotype, W--287859--isotype, W--1323217--isotype, X--isotype, Z--photo of type), *s.n.* [near Cuernavaca] (Cp, Mu--4176, V--9009); *Rose & Painter 7225* (N, W--450808). Oaxaca: *Reko 3343* (W--888742).

CITHAREXYLUM PACHYPHYLLUM Moldenke in Fedde, Repert. 37: 232--233. 1934.

Literature: Moldenke in Fedde, Repert. 37: 232--233. 1934; Hill, Ind. Kew. Suppl. 9: 67. 1938; Moldenke, Geogr. Distrib. Avicenn. 23. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34 & 88. 1942; Moldenke, Alph. List Cit. 1: 122, 317, & 325 (1946), 2: 427 (1948), 3: 686 & 713 (1949), and 4: 1065 & 1113. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 72 & 179. 1949.

Shrub, to 2 m. tall; branches and branchlets obtusely tetragonal, medium or slender in thickness, strong, dark-brown, often verruculose because of the many prominent lenticels, minutely brownish-furfuraceous, puberulent, or glabrate, twiggy; twigs slender, dark-brown, more or less tetragonal, puberulent or glabrate; nodes rather obscurely annulate; principal internodes abbreviated, 0.7--3 cm. long; leaf-scars borne on short and slender, rather inconspicuous sterigmata 1--2 mm. long; leaves decussate-opposite, very numerous; petioles slender, 2--3 mm. long, minutely puberulent or subglabrate; leaf-blades coriaceous, very dark-green and shiny on both surfaces, nigrescent in drying, oblong or elliptic, 1.4--2.5 cm. long, 7--12 mm. wide, acute at the apex, entire or with a few minute antrorse or divergent teeth along the margins, subcuneate at the base, not glanduliferous, glabrous above, densely punctate beneath; midrib and the 3--5 rather indistinct secondaries very slender, minutely prominulent or plane, varying to subimpressed above, slightly prominulent beneath; vein and veinlet reticulation sparse, often not obvious; racemes terminating the many short lateral twigs, simple, 1--15 cm. long, many-flowered; peduncle and rachis slender, dark-brown, puberulent or subglabrate, the former much abbreviated; pedicels very slender, 1 mm. long or less; bracts and bractlets absent; prophylla linear-setaceous, about 1 mm. long; calyx obconic, about 3.9 mm. long and 2.8 mm. wide, conspicuously 5-costate, glabrous, the rim very shortly 5-dentate; corolla infundibular, white, its tube about 4.3 mm. long, about 0.8 mm. wide at the base and 2.6 mm. wide at the apex, externally glabrous, densely tomentose in the throat within, the limb 4- or 5-lobed, the lobes rounded-ovate, about 1.3 mm. long and 1.4 mm. wide, rounded at the apex; stamens 4 or 5, equal, included, inserted about 2.3 mm. below the mouth of the corolla-tube, not plainly didynamous; filaments very much abbreviated, about 0.2 mm. long; anthers oblong, about 1.3 mm. long and 0.5 mm. wide; pistil included; style thick, about 1 mm. long, glabrous; stigma slightly ampliate, very shortly 2-lobed, the lobes indistinct, about 0.2 mm. long; ovary elliptic, about 1 mm. long and wide, glabrous; fruiting-calyx cupuliform, about 4 mm. long and 7 mm. wide, glabrous, shiny, indurated, ribbed, its rim rather irregularly 5-lobed with blunt lobes; fruit very large, oblong-pyriform, about 11 mm. long and 13 mm. wide, very firm. fleshy, deep-purple when fresh, black in drying, 2-seeded.

The type of this alpine species was collected by James Francis Macbride (no. 3490) in a shrubby canyon, at an altitude of

9500 feet, Huariaca, Junín, Peru, on April 12, 1923, and is deposited in the herbarium of the Chicago Natural History Museum. Weberbauer states that the species grows in small groups of shrubs on the grass steppes, Asplund found it in shady places below a cliff, and Metcalf encountered it in rocky soil on dry open hillsides. It has been found at altitudes of 3400 to 3620 meters, blooming in May and June, fruiting in May. It has been confused by herbarium workers with C. dentatum D. Don, C. ilicifolium H.B.K., and C. punctatum Greenm., with all of which species it shows considerable affinity. In all, 10 herbarium specimens, including the type, and 4 mounted photographs have been examined.

Citations: PERU: Ayacucho: Weberbauer 5565 (B, E—1008719, F—628132, G, W—1473534). Junín: Macbride 3090 (B—photo of type, F—534160—type, K—photo of type, N—isotype, N—photo of type, S—photo of type, Z—photo of type). Lima: Asplund 11496 (S); A. Mathews 1021 (K). Puno: R. D. Metcalf 30464 (Ca—695131).

CITHAREXYLUM PENTANDRUM Vent., Descr. Pl. Nouv. Jard. Cels. 47, pl. 47. 1800.

Synonymy: Citharexylum molle Jacq., Hort. Schönbr. 4: 9, pl. 417. 1804 [not C. molle Salisb., 1796, nor H.B.K., 1818, nor Hook., 1940]. Citharexylum pulverulentum Pers., Syn. Pl. 2: 142. 1806. Citharexylum quadrungulare Hort. Madrit. ex Pers., Syn. Pl. 2: 142, in syn. 1806. Citharexylon molle Jacq. apud Steud., Nom. Bot., ed. 1, 202. 1821. Citharexylon pulverulentum Pers. apud Steud., Nom. Bot., ed. 1, 202. 1821. Citharexylon quadrangulare Hort. Madrit. ex Steud., Nom. Bot., ed. 1, 202, in syn. 1821 [not C. quadrangulare Jacq., 1760, nor Citharexylum quadrangulare L., 1786, nor Schau., 1864, nor Sessé & Moc., 1894, nor Millsp., 1907, nor Griseb., 1909, nor Hort., 1911, nor Jacq., 1909, nor A. Rich., 1909]. Citharexylon pentandrum Vent. apud Steud., Nom. Bot., ed. 1, 202. 1821. Citharexylon pentandrum Spreng. in L., Syst. Veg., ed. 16, 2: 764. 1825. Citharexylum villosum var. pentandrum Griseb., Syst. Untersuch. Veg. Kar. 108. 1857. Citharexylum villosum β pentandrum (Vent.) Griseb., Abhand. König. Gesell. Wissen. Götting. 7: 256. 1857. Citharexylum quadrangulare Boutelou ex O. E. Schulz in Urb., Symb. Antill. 6: 67, in syn. 1909. Citharexylum angulatum Ruíz ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. Citharexylum buekii Fischer, in part, ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. Citharexylum canescens Bueck ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. Citharexylum foetidum Hort. ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940. Citharexylum ovatum Paulowski ex Moldenke, Prelim. Alph. List Invalid Names 17, in syn. 1940. Clerodendron pentandrum (Vent.) Bueck ex Moldenke, Prelim. Alph. List Invalid Names 21, in syn. 1940. Citharexilon pentandrum Vent. ex Moldenke, Alph. List Invalid Names Suppl. 1: 4, in syn. 1947. Citharexylum tetrangulare Hort. ex Moldenke, Alph. List Invalid Names Suppl. 1: 5, in syn. 1947.

Literature: Salisb., Prodr. 108. 1796; Vent., Tabl. Regn. Veget. 1: liv. 1799; Vent., Descr. Pl. Nouv. Jard. Cels. 47, pl. 47. 1800; Sw., Fl. Ind. Occ. 2: 1043. 1800; Desf., Tabl. Ecol. Bot., ed. 1, 54. 1804; Jacq., Hort. Schönbr. 4: 9, pl. 417.1804; Pers., Syn. Pl. 2: 142. 1806; Poir. in Lam., Encycl. Méth. Bot. Suppl. 2: 367--368. 1811; Poir., Dict. Sci. Nat. 9: 285--286. 1817; Cels, Cat. Arbres 11. 1817; Steud., Nom. Bot., ed. 1, 202. 1821; Spreng. in L., Syst. Veg., ed. 16, 2: 764. 1825; Desf., Cat. Pl. Hort. Reg. Paris, ed. 3, 91. 1829; Cham., Linnaea 7:116. 1832; Steud., Nom. Bot., ed. 2, 1: 375. 1840; Walp., Repert. 4: 74. 1845; Schau. in A. DC., Prodr. 11: 613. 1847; Griseb., Syst. Untersuch. Veg. Kar. 108. 1857; Griseb., Abhand. König. Gesell. Wissen. Götting. 7: 256. 1857; Bocq., Adansonia 3: 223. 1863; Jacks., Ind. Kew. 1: 550. 1893; O. E. Schulz in Urb., Symb. Antill. 6: 67--68. 1909; Stapf, Ind. Lond. 2: 220. 1930; Moldenke, Geogr. Distrib. Avicenn. 7 & 36. 1939; Moldenke, Alph. List Common Names 6. 1939; Moldenke, Prelim. Alph. List Invalid Names 15--17 & 21. 1940; Moldenke, Suppl. List Common Names 6. 1940; Moldenke, Alph. List Invalid Names 13--15, 19, & 58. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 27, 71, & 88. 1942; Moldenke, Phytologia 2: 97. 1944; Moldenke, Alph. List Cit. 1: 40, 77, 116, 118, 130, 135, 169, 276, & 277. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 4--5. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 52. 1948; Moldenke, Alph. List Cit. 2: 353, 356, 357, 402, 408, 409, 412, 414, 420, 421, 431, 434, 435, 447--449, 458, 459, 481, 489, 490, 528, 530, 560--562, 564--567, & 581 (1948), 3: 663, 702, 736, 801, 810, 881, & 898 (1949), and 4: 1087, 1129, 1207, 1208, & 1232. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 49, 158, & 179. 1949; Moldenke, Phytologia 3: 465. 1951; Moldenke, Journ. Calif. Hort. Soc. 15: 80. 1954.

Illustrations: Lam., Illustr. 3: pl. 545, fig. 2 g--o. 1797; Vent., Descr. Pl. Nouv. Jard. Cels. pl. 47. 1800; Jacq., Hort. Schönbr. 4: pl. 417 (colored). 1804.

Shrub or tree; branchlets medium-slender; twigs very slender, stramineous or gray, acutely or obtusely tetragonal, often many-ribbed, puberulent or white-pilose; nodes annulate, sometimes obscurely so; principal internodes 2.5--8.3 cm. long; buds very woolly; leaf-scars borne on rather short ascending sterigmata 1--3 mm. long; leaves decussate-opposite; petioles slender, 6--12 mm. long, densely or lightly pilose; leaf-blades chartaceous or submembranous, dark-green above, usually slightly lighter beneath, ovate or ovate-oblong to oblong, or elliptic, 2.2--9 cm. long, 1.3--4.5 cm. wide, acute at the apex, entire or rather coarsely and sometimes irregularly serrate except at the base, broadly rounded or acute at the base, with a pair of very small glands at the very base, slightly scabrous above or sometimes merely pilose along the midrib (or more or less densely pubescent-pilose when immature), densely pilose-pubescent beneath (especially uniformly pilose on the midrib, secondaries, and all the vein and veinlet reticulation); midrib very slender, prominulent beneath; secondaries very slender, 3--6 pairs, prominulent beneath, often very slightly so above on mature leaves; racemes axillary or (mostly) terminal, 1.5--14.5 cm. long, 1--1.5 cm. wide during anthesis, mostly erect, many-flowered, not dense, simple; peduncles and rachis slender, densely incanous-pubescent, the former 3--9 mm. long; pedicels very slender, 1--2 mm. long, densely pubescent or villosulous, the lower ones in the raceme usually longer than the upper, sometimes obsolete; bracts and bractlets none: prophylla linear or filiform, 1--3 mm. long, pubescent or villosulous, mostly long and conspicuous, the lower ones in the raceme usually longer than the upper ones; flowers pedicellate or subsessile, subpendulous; calyx obconic-cyathiform or campanulate, 3--4 mm. long, varying from more or less pubescent to villous or velutinous externally, its rim obsoletely or manifestly 5-dentate, the teeth triangular, acute or broadly acuminate and muticous; corolla campanulate or hypocrateriform, white, twice as long as the calyx, 6--8 mm. long, the tube about equaling the calyx, sparsely pilose externally, very densely pilose within, villous in the throat, the limb 5-parted, lanuginous on both surfaces, the lobes obovate, rounded at the apex; stamens usually 4, sometimes 5, much shorter than the corolla and included in its tube, the fifth usually reduced to a staminode; filaments about 0.5 mm. long; anthers about 0.75 mm. long; staminode more or less rudimentary; pistil about 3 mm. long; style about 1.2 mm. long;stigma broader than the style, bilobed; ovary globose, faintly 2-lobed; fruiting pedicels about 1.5 mm. long; fruiting-calyx cupuliform, indurated, light, about 3 mm. long and 5 mm. wide, ribbed, pubescent, its rim 5-apiculate or 5-dentate, the teeth broadly elliptic and obtuse, often split in age; fruit drupaceous, oblong or obovate, 4.5--9 mm. long, 3.5--6 mm. wide, fleshy, glabrous, black and wrinkled in drying, 2-sulcate when dry; pyrenes bilocular.

The type of this puzzling species was collected by Anselme Riédlé in forests somewhere in Puerto Rico, deposited in the Ventenat herbarium. What appears to have been an isotype was seen by me in the Berlin herbarium before World War II and was photographed by me. The Herb. Persoon specimen in the Leiden herbarium, cited below, is probably the type of C. pulverulentum, and the Herb. Hort. Schönbrunn specimen in the Vienna herbarium is probably the type of C. molle.

Most of the specimens preserved in herbaria are from cultivated material grown in botanical gardens, and it is not completely certain that all of the West Indian material cited below was from wild material. The species was recorded by me as cultivated in Jamaica, Haïti, and Puerto Rico in my publications on the known geographic distribution of the members of this and related families, but I am now regarding these specimens as from native material. The finest collection of specimens of this species is in the Vienna herbarium. Poiret makes the comment for C. molle that "Le lieu natal de cette plante n'est pas connu". He comments further that C. pentandrum may possibly belong to the genus Duranta, but he continues to classify it in Citharexylum because of its close similarity to C. subserratum Sw. Apparently he never saw the fruit, because one glance at this leaves no doubt that the plant is a true Citharexylum.

Grisebach's C. villosum var. pentandrum is sometimes given in the synonymy of C. fruticosum var. villosum (Jacq.) O. E. Schulz, but Grisebach distinguishes it by its shorter corolla-tube and 5 stamens. There seems no doubt that his trinomials belong in the synonymy of C. pentandrum. He records the plant, however, from St. Thomas and "Dom." [=Dominica?], but the specimens on which he bases these records, if any, have not as yet been seen by me. On the other hand, the C. tomentosum Poir., included by Schauer with a question in the synonymy of C. pentandrum, actually belongs in that of C. fruticosum var. villosum. Schauer states that he saw C. pentandrum cultivated and subspontaneous in the Berlin and De Candolle gardens. The Pavon specimens in the Herbier Boissier are labelled "Peruvia" only, so there is no way of being certain if they came from wild or cultivated material. I am assuming that they are from cultivated plants. Others are labelled "Nueva España", a term usually applied to Mexico in his time.

Herbarium material of this species has been confused with and misidentified by herbarium workers as C. caudatum L., C. cinereum L., C. dentatum D. Don, C. subserratum Sw., and C. villosum Jacq. Common names recorded for it are "bois de guitarre", "citharexylum a cinq étamines", "citharexylum a feuillès molles", "cotelet à cinq étamines", and "cotelet à feuille molles".

Chamisso says "foeta ossiculis duobus, dorse convexis, facie paululum concavis fere planis, bilocularibus, dispermis. Speciminibus spontaneis nostris folia forma variabilia firmiora, floresque brevius pedicellati quam hortensibus."

In all, 100 herbarium specimens, including the type collections of all the names involved, and 11 mounted photographs and illustrations have been examined.

Citations: JAMAICA: Buek s.n. [Jul. 1823] (L); Schagin s.n. [1840] (N, V--285056). HISPANIOLA: Haïti: Herb. Portenschlag s.n. (V). PUERTO RICO: Bertero s.n. [herb. Sprengel] (B, B); Riédlé s.n. [herb. Ventenat] (B--isotype, K--photo of isotype, N--photo of isotype, S--photo of isotype, Z--photo of isotype). WEST INDIES: Island undesignated: Herb. Jewett s.n. (Mi). CULTIVATED: Austria: Herb. Hort. Bot. Acad. Viennen. s.n. [17 Junio 1805] (L); Herb. Hort. Schönbrunn. s.n. (N--photo, S, V--285057, V, Z--photo); Herb. Hort. Vindob. s.n. (V--130810, V--130811); Herb. Portenschlag s.n. (V--1393--illustration, V, V); Herb. Schreber s.n. (Mu--763); Host s.n. [hort. Vindob.] (V). Denmark: Herb. Liebmann s.n. (Cp); Herb. Vahl s.n. (Cp, Cp); Mahn f. s.n. (Cp). England: Herb. Hort. Kew s.n. (Bm). France: Collector undesignated s.n. [2 aout, h. M.] (Dc), s.n. [29 aout] (Dc), s.n. [Jard. Plant.] (K); Herb. Harvey s.n. [jardin de Montpellier]

(Du--166405); Herb. Hort. Bot. Monsp. s.n. [1826] (L); Herb. Hort. Bot. Paris s.n. (Cp, Cp); Herb. Ledebour s.n. (L); Herb. Le Monnier s.n. (Cb); Herb. Ventenat s.n. [hort. Celsianus] (Cb, Cb); Michel s.n. [hort. Monspeliensis, 1807] (Dc); Perrottet s.n. [Jard. de Paris] (Cb). Germany: Collector undesignated s.n. [cult. Biroli] (B); Crépin s.n. [H. Bot. Berol.] (Br); Herb. Bonpland s.n. [hort. Berol.] (P); Herb. Hort. Berol. s.n. [1806--12] (B), s.n. [Jun. 1844] (B), s.n. [Apr. 1846] (N--photo, S, Z--photo), s.n. [1854] (B), s.n. [Aug. 17] (B); Herb. Hort. Carlsruhe s.n. (Us); Herb. Hort. Monacensis s.n. [15.X.1849] (Mu--764); Herb. Kümmerer s.n. [Hort. Bot. Monac. 1839] (Mu); Herb. Link s. n. (B); Herb. Mertens s.n. (L); Herb. Nees von Esenbeck s.n. (L); Herb. Prince Paul s.n. [hort. Mergentheim] (Mu--1606); Herb. Schrader s.n. (L); Herb. Schwägrichen s.n. [hort. Breiteriano] (Mu--1382, Mu--1383); Herb. Schwetzing s.n. [19 Sept. 1830] (L); Herb. Zuccarini s.n. (Mu--765); Lindblad s.n. [hort. Berol.] (Us); Willdenow s.n. (Dc). Italy: Herb. Harvey s.n. [h. P. 1824] (Du--166410); Herb. Hort. Florentia s.n. (Cb); Herb. Hort. Neapol. s.n. [Jul. 1832] (Le). Java: Herb. Mus. Bot. Bogor. XI.G.51 ["25732-4"] (Bz--25732, Bz--25733, Bz--26528, Bz, Bz, Bz, Bz, Bz, Bz, Bz, Bz, Bz, N), XI.G.51a (Bz--25735, Bz--26529, N). Mexico: Herb. Bernhardi s.n. (E--119103, E--119161); Hornbeck s.n. (S); Pavon s.n. [Nueva España] (N, X, X, X). Netherlands: Herb. Lugd.-Bat. 908266-652 (Le); Herb. Persoon s.n. (Le). Peru: Herb. Pavon s.n. (X, X, X, X); Ruíz s.n. (B). Russia: Herb. Bot. Paulowsk. s. n. [1840] (V--285056); Herb. Fischer s.n. (L). Spain: Collector undesignated 54 (Q); Dumeril s.n. [hort. Madrid, 1806] (Dc). Switzerland: Herb. Seigneux s.n. [Genève] (X). LOCALITY OF COLLECTION UNDESIGNATED: Collector undesignated 16 (Q), 56, in part (Q), 57 (Q), s.n. (Dc). MOUNTED ILLUSTRATIONS: Ventenat, Descr. Pl. Nouv. Jard. Cels. pl. 47. 1800 (Cb, Cb).

x CITHAREXYLUM PERKINSI Moldenke, hybr. nov.

Planta hybrida naturalis, foliis firmis anguste ellipticis vel lanceolatis 7.5--16 cm. longis, 2--6.5 cm. latis, ad apicem obtusis vel acutis vel breviter acuminatis, integerrimis, ad basin acutis, nitidis, utrinque glabris, nervis utrinque planis, floribus breviter pedicellatis.

Natural hybrid between C. caudatum L. and C. spinosum L., with characters more or less intermediate between the two. The leaf-blades are firm in texture, narrowly elliptic or lanceolate, 7.5-16 cm. long, 2--6.5 cm. wide, varying from obtuse or acute to shortly acuminate at the apex, entire along the margins, acute at the base, glabrous and shiny on both surfaces, the venation rather obscure when young, plane on mature leaves, not at all or hardly raised.

The type of this hybrid was collected by Janet Russell Perkins (no. 1320) in pastures near Troy, at an altitude of 1500 feet, Jamaica, on April 3, 1917, and is deposited in the herbarium of the Botanisches Museum at Berlin. The collector notes that it is a tree 20 feet tall, with white flowers, and is called "juniper berry" by the inhabitants. The only two specimens seen by me were annotated by me in 1936 as C. caudatum and as C. spinosum respectively. When only immature leaves are seen the resemblance to C. caudatum is striking, but the mature leaves are more like those of C. spinosum. Both parents are well known on the island.

Citations. JAMAICA: Perkins 1320 (B—type, G—isotype, N—photo of type, Z—photo of type).

CITHAREXYLUM PERNAMBUCENSE Moldenke, Alph. List Common Names 26, hyponym (1939); Phytologia 1: 442. 1940.

Literature: Moldenke, Alph. List Common Names 26. 1939; Moldenke, Geogr. Distrib. Avicenn. 25. 1939; Moldenke, Phytologia 1: 442. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 36 & 88. 1942; Moldenke, Phytologia 2: 97. 1944; Salisb., Ind. Kew. Suppl. 10: 53. 1947; Moldenke, Alph. List Cit. 3: 814 & 815. 1949; Pickel, Piso & Marcgrave Bot. Bras. 90. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 76 & 179. 1949.

Tree; branches gray, glabrate; branchlets chestnut-brown, minutely puberulent, becoming glabrescent, subterete; nodes not annulate; principal internodes 2.7—5.4 cm. long; leaves decussate-opposite or subopposite; petioles very slender, 9—15 mm. long, chestnut-brown, minutely puberulent, conspicuously canaliculate above; leaf-blades lightly chartaceous, oblong or subovate to obovate, 8.8—12 cm. long, 5.3—7 cm. wide, acute or obtuse at the apex, entire, acuminate at the base, rather shiny above, with 2 elongate glands adjacent to the midrib at the base beneath, minutely and obscurely puberulent or strigillose above, but becoming glabrescent, densely velutinous-pubescent beneath; midrib slender, practically plane above, prominent beneath; secondaries slender, 5—7 per side, arcuate-ascending, not conspicuously confluent, prominulous beneath; racemes terminal or axillary, erect, to 23 cm. long, about 2.5 cm. wide, many-flowered, the flowers pseudosecund; peduncles slender, 1.5—6.5 cm. long, densely puberulent; rachis slender, densely puberulent; pedicels to 1 mm. long, densely puberulent; calyx about 5 mm. long and 4 mm. wide, puberulent; corolla-tube 15—17 mm. long, the limb about 10 mm. wide; fruit drupaceous, red when fresh.

The type of this species was collected by my good friend and colleague, Dom Bento José Pickel (no. 1501) at Caruarú, Tapera, Pernambuco, Brazil, in January, 1928, and is deposited in the herbarium of the Botanisches Museum at Berlin. The holotype has more ovate and elongate leaf-blades with shorter pubescence beneath than are seen on the other specimens. The species is found in wet high places on uncultivated ground in Parahyba and along roadsides and in open fields in Pernambuco. It is called "mama de cabra" and "salgueiro", and has been collected in anthesis in April and May, and in fruit in May and August.

Pickel, in the work listed above, refers to a fig. 134 in Piso, ed. 1 "segunda", but this reference is probably actually to book 3, chapter 18, and page 133 of Piso's work.

In all, 9 herbarium specimens, including the type, and 5 mounted photographs have been examined.

Citations: BRAZIL: Parahyba: *Coelho de Moraes 839* (N, Z). Pernambuco: *Pickel 1501* (B--type, E--photo of type, N--isotype, N--photo of type, S--photo of type, W--photo of type, Z--photo of type), *1941* (B, I, N), *3921* (I, N).

CITHAREXYLUM POEPPIGII Walp., Repert. 4: 76 [as "*Citharexylon*"]. 1845; Schau. in A. DC., Prodr. 11: 612. 1847.

Synonymy: *Citharexylum glandulosum* Poepp. ex Moldenke, Prelim. Alph. List Invalid Names 16, in syn. 1940 [not *C. glandulosum* Urb. & Ekm., 1929].

Literature: Walp., Repert. 4: 76. 1845; Schau. in A. DC., Prodr. 11: 612. 1847; Schau. in Mart., Fl. Bras. 9: 270. 1851; Jacks., Ind. Kew. 1: 550. 1893; Moldenke, Alph. List Common Names 22 & 23. 1939; Moldenke, Geogr. Distrib. Avicenn. 22 & 25. 1939; Moldenke, Prelim. Alph. List Invalid Names 16. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 33, 34, 36, & 88. 1942; Moldenke, Alph. List Invalid Names 14. 1942; Moldenke, Phytologia 2: 97. 1944; Moldenke, Castanea 10: 41. 1945; Moldenke, Alph. List Cit. 1: 117, 134, & 268. 1946; Moldenke, Phytologia 2: 384. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 5. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 76. 1948; Moldenke, Alph. List Cit. 2: 331, 348, 448, & 581 (1948), 3: 731, 823, 824, & 915 (1949), and 4: 1070, 1080, & 1198. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 59, 69, 72, 76, & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Moldenke, Mutisia 6: 4. 1952; Moldenke, Phytologia 4: 451. 1953; Uribe Uribe, Mutisia 25: 25. 1956.

Shrub or small wide-spreading tree, to 18 m. tall; trunk to 30 cm. in diameter and 1.1 m. in circumference, whitish, with basal ridges; bark ochraceous-whitish, more or less rough and scaly; wood light-ochraceous; branchlets and twigs rather stout, medullose or hollow, light-brown, densely but minutely puberulent, obsoletely or acutely tetragonal or 5-angled; nodes annulate, swollen; principal internodes elongate, 5.5--8 cm. long; leaf-scars large, borne on stout closely appressed sterigmata to 5 mm. long, overlapping the apex of the sterigma; leaves decussate-opposite or ternate, sometimes approximate on vigorous shoots; petioles very stout, 2.9--4 cm. long, minutely puberulent or glabrous, ampliate and more or less peltate at the base; leaf-blades large, chartaceous or subcoriaceous, light- or dark-green above, somewhat lighter beneath, broadly elliptic, 16.5--23.5 cm. long, 10--12.3 cm. wide, acute at the apex, entire, broadly rounded or gradually acute at the base and prolonged into the petiole, bearing a pair of very large, conspicuous, oblong or pelviform glands about 5 mm. long and 1.5 mm. wide (usually concave above when dry) on the prolongation, glabrate above (except for the puberulent midrib), densely very short-pubescent beneath with soft, appressed, ferruginous, tomentellous hairs, not lepidote; midrib stout, rather sharply and narrowly prominent above, very broad and prominent beneath; secondaries slender, 9—14 pairs, ascending, often not very arcuate, more or less anastomosing near the margins, very prominent beneath, very slightly prominulent above; vein and veinlet reticulation very abundant, slightly prominulent on both surfaces; racemes axillary and terminal, often 2 from the same axil, subequal, often compound and paniculate with 1 or 2 short branches at the apex of the peduncle, usually densely many-flowered, erect, lax, divergent or subnutant, 4—16 cm. long, 1—2 cm. wide in anthesis, not at all secund; peduncle and rachis stoutish, light-brown, very densely puberulent, the former 0.5—2.6 cm. long and subterete;pedicels very slender, to 1 mm. long, densely brown-puberulent; bracts not seen, perhaps none; bractlets few, linear, to 6 mm. long, puberulent; prophylla linear-setaceous, minute, to 1 mm. long, puberulent; flowers fragrant, sessile or subsessile; calyx membranaceous, pale-green, obconic, 3—4 mm. long and wide, not venose, very lightly puberulent, its teeth ovate and obtuse, often exiguous and irregular, sometimes lobe-like; corolla infundibular or hypocrateriform, white, about 18 mm. long when expanded, glabrous, its tube pale-green or greenish-white, cylindric, the limb white, the lobes elliptic, obtuse or rounded at the apex; stamens 5; filaments very short, inserted in the throat of the corolla-tube; style slightly surpassing the calyx; fruit drupaceous, red when fresh.

The type of this outstanding species was collected by Eduard Friedrich Poeppig (*no. 2910*) in woods at Ega, along the Amazon River, Amazonas, Brazil, in January of 1831 and in 1832. The collector notes: "Arbor praealta, speciosa. Etiam in prov. Maynas crescit ubi audit 'Mullu-caspi', *i.e.*, hispan. 'Palo do Chaquiras' (chaquira = glascoralle) verasimiliter ob fructas rubras. C. ramis tetragonis; foliis late ellipticis, utrinque acutis, subtus pubescentibus; glandula petiolum apice utrinque terminante excavata; spicis terminalibus divaricatis paniculatis; calyceque obtuse quinquedentato puberulis; corollae pentandria fauce villosa." Walpers, in the reference listed above, points out its close relationship with *C. rugendasii* Cham. [=*C. mocinni* D. Don] of Mexico. The 1831 sheets of the type collection are inscribed "*Citharexylum glandulosum* Poepp.", and the Pará collection of Poeppig has the leaves rounded and subcucullate at the apex.

The finest representation of the species is in the Vienna herbarium. It has been confused with and specimens misidentified as *C. macrophyllum* Poir., *C. molle* H.B.K., *C. pilosum* Jacq., and *C. villosum* Jacq. Common names are "galhos novos ôcos", "mullu-caspi", "palo de chaquiras", and "tinto". It has been found in dense humid forests, on riverbanks, and in the mata da serra formation, at altitudes of 100 to 450 meters, blooming from January to May, July, and October, and in fruit in November. The *Poeppig 2119* cited by Schauer is herein regarded as var. *margaritaceum*

Poepp. & Moldenke. In all, 52 herbarium specimens, including the type collections of all the names involved, and 3 mounted photographs have been examined.

Citations: COLOMBIA: Meta: Jaramillo, Mesa, Idrobo, & Fernández 303 (W—1900434), 343 (W—1900440); Philipson, Idrobo, & Fernández 1380 (Bm, N, W—2026125). Valle del Cauca: Cuatrecasas 15949 (N), 17606 (N). VENEZUELA: Aragua: Aristeguieta 2787 (N). ECUADOR: Napo-Pastaza: Asplund 9001 (S), 10227 (S); Mexia 7158 (N, W—1592025). Oriente: Heinrichs 408 (B, B, N). PERU: Loreto: J. M. Schunke 365 (Ca—659792, F—997655, N). BRAZIL: Amazonas: Black 48-2491 (N, N); Cardona 1421 (W—1906083); Murça Pires 528 (Be—28486, Be—28487, N, N, N); Poeppig 2910 (B—isotype, B—isotype, B—isotype, Cb—isotype, Dc—isotype, F—686442—isotype, K—photo of isotype, L—isotype, L—isotype, N—isotype, N—isotype, N—photo of isotype, P—isotype, S—isotype, V—111251—isotype, V—285055—isotype, V—isotype, V—isotype, X—isotype, Z—photo of isotype). Pará: Black 50-9081 (N); Murça Pires 3175 (Cb, N), 3209 (N, Z); Poeppig s.n. (B, P, P, P).

CITHAREXYLUM POEPPIGII var. MARGARITACEUM Poepp. & Moldenke ex Moldenke in Fedde, Repert. 37: 233. 1934.

Synonymy: Citharexylum margaritaceum Poepp. ex Moldenke, Prelim. Alph. List Invalid Names 17, in syn. 1940. Citharexylum paniculatum Poepp. ex Moldenke, Prelim. Alph. List Invalid Names 17, in syn. 1940 [not C. paniculatum Poir., 1823, nor C. panniculatum Gaertn. f., 1909, nor Citharexylon paniculatum Gaertn., 1788]. Citharexylum poeppigii var. margaritense Poepp. & Moldenke ex Moldenke, Alph. List Cit. 2: 616, sphalm. 1948.

Literature: Moldenke in Fedde, Repert. 37: 233. 1934; Moldenke, Geogr. Distrib. Avicenn. 22, 23, 25, & 28. 1939; Moldenke, Prelim. Alph. List Invalid Names 17. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 33, 34, 36, 40, & 88. 1942; Moldenke, Alph. List Invalid Names 14—15. 1942; Moldenke, Castanea 10: 41. 1945; Moldenke, Alph. List Cit. 1: 37, 134, 169, 204, & 268. 1946; Moldenke, Phytologia 2: 385. 1947; Moldenke, Alph. List Cit. 2: 327, 331, 339, 429, 445—447, 616, & 624 (1948), 3: 667, 687, & 823 (1949), and 4: 988, 1016, & 1079. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 59, 69, 72, 76, 96, & 179. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 4. 1949; Moldenke, Phytologia 3: 287. 1950.

This variety differs from the typical form of the species in having its leaf-blades ovate to ovate-elliptic or rarely oblong, usually 21—25 (rarely 10—13) cm. long and 7.5—8.8 (rarely 4.5 to 5.5) cm. wide, densely puberulent and lepidote beneath, the secondaries 12—15 pairs, the petioles 1.2—2.5 cm. long, the racemes to 45 cm. long, the peduncles to 7 cm. long, and the corollas only about 7 mm. long when expanded. It is said to be a large or small tree, 6—15 m. tall, the trunk 10 cm. in diameter at breast height, the inflorescences pendulous, the flowers odorous, and the corollas white.

The type of this variety was collected by Eduard Friedrich Poeppig (no. 2219) in woods along the banks of the Rio Huallaga at Yurimaguas, Maynas, Loreto, Peru, in December, 1830, and is deposited in the herbarium of the Naturhistorisches Museum at Vienna. Poeppig describes it as follows: "C. ramis obtusangulis; foliis ovato-ellipticis oblongisve, acutis, subtus lepidotis, pubescentibus; spicis axillaribus ternis, erectis, calycibusque quinquedentatis tomentosis; floribus erectis; corollis quinquefidis pentandris fauce villosis." It has been collected at 200 meters altitude, blooming in January, February, April, and November. It is called "racedera", and Little states that it is used in medicine in the treatment of fevers and is propagated from cuttings "as the name, from racer, suggests". The material is all surprisingly uniform with the exception of the Bolivian specimens which have the leaf-blades only 10--13 cm. long and 4.5--5.5 cm. wide. Cuatrecasas 15949a is a mixture with the typical C. poeppigii with very large flowers. In all, 43 herbarium specimens, including the types of all the names involved, and 8 mounted photographs have been examined.

Citations: COLOMBIA: Valle del Cauca: Cuatrecasas 15949a (N). ECUADOR: Esmeraldas: E. L. Little 6283 [U. S. Forest Serv. 98379] (W--1877608). Napo-Pastaza: Fagerlind & Wibom 2318 (S), 2410 (S), 2410-II (S). Oriente: Heinrichs 408 (Cb, Mu). Province undetermined: Benoist 4788 [Verastorres] (P). PERU: Loreto: Klug 3943 (Ca--710166, E--1110970, F--853262, Gg--247908, I, N, S); J. G. Kuhlmann s.n. [Herb. Rio de Jan. 22534] (N); Poeppig 2119 [Yurimaguas, Maynas, 1830] (B--photo of type, Cb--isotype, K--photo of type, N--isotype, N--photo of type, P--isotype, S--photo of type, V--type, V--isotype, V--isotype, X--isotype, Z--photo of type); Tessmann 3491 (B, Cb, F--686483, Hb, N, S), 5020 (B, S). BRAZIL: Acre Territory: J. G. Kuhlmann s.n. [Herb. Rio de Jan. 22535] (N). Amazonas: Ducke s.n. [Herb. Rio de Jan. 35665] (N); Poeppig 2119 [prope Egam, 1834; Macbride photos 7876] (B, B--photo, Dc, F--645725--photo, F--686436, Kr--photo, L, N--photo, V--105848, V).

CITHAREXYLUM PSILACANTHUM Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 207. 1863.

Literature: Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (3): 207. 1863; Jacks., Ind. Kew. 1: 550. 1893; Moldenke, Geogr. Distrib. Avicenn. 41. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 88 (1942) and [ed. 2]., 166 & 179. 1949.

Stems terete, much branched; branches and branchlets almost horizontally spreading, densely pubescent, armed with long slender spines in the axils; leaves opposite; petioles short; leaf-blades ovate, acute and rather obtusely mucronate at the apex, entire, glabrous except for the appressed-pilose midrib beneath; inflorescence axillary; peduncles short, 1-or rarely 2-flowered, not equaling the subtending leaves when in flower; calyx shortly and unequally 5-dentate, the teeth rather obtuse; corolla tubular-infundibular, 3 times as long as the calyx, 4- or 5-toothed; stamens 4, didynamous, with a fifth rudimentary one minute, linear, and placed below the others; style scarcely thickened at the apex; ovary 4-ovulate.

Nothing is known of this species except the original description by Turczaninow, in which it is stated that the type specimen is without a label. Therefore, the collector, number, date, and locality of collection are all unknown ("ob schedulam delapsam patria mihi ignota"). It is to be hoped that the type may someday soon be made available for examination so that the status of this plant can be determined.

CITHAREXYLUM PTEROCLADUM Donn. Sm., Bot. Gaz. 33: 255--256. 1902.

Synonymy: Citharexylum pterialadum D. Sm., in herb. Citharexylum ptericladum D. Sm., in herb.

Literature: J. D. Sm., Bot. Gaz. 33: 255--256. 1902; Prain, Ind. Kew. Suppl. 3: 43. 1908; Moldenke, Geogr. Distrib. Avicenn. 13 & 15. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 16, 19, 20, & 88. 1942; Moldenke, Alph. List Cit. 1: 37, 218, & 307 (1946), 2: 334, 345, 349, 419, 437, 542, 543, 594, & 632 (1948), 3: 714, 902, & 940 (1949), and 4: 1013, 1022, 1026, 1031, & 1057. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 29, 35, 36, & 179. 1949; Matuda, Am. Midl. Nat. 44: 576. 1950.

Shrub or handsome spreading tree, to 30 m. tall; trunk to 90 cm. in diameter at breast height; crown loosely branched, open; bark brown, rough, shed in small scales; branches and branchlets massive, very stout and robust, very sharply tetragonal, square in cross-section, hollow, usually very conspicuously 4-winged, brown, glabrous; twigs slender or stoutish, acutely tetragonal, brown, more or less 4-winged or -margined, square in cross-section, glabrous; nodes conspicuously annulate; principal internodes elongate, 1.7--8 cm. long; leaf-scars borne on large, thick, conspicuous, ascending or divergent sterigmata to 7 mm. long and 5 mm. wide, very broad, wider than the body of the sterigma; leaves decussate-opposite; petioles mostly slender, 1.5--4.5 cm. long, ampliate at the base, glabrous; leaf-blades chartaceous or membranous, uniformly bright-green on both surfaces, elliptic, 5--17.5 cm. long, 2.3--9 cm. wide, acute or bluntly short-acuminate at the apex, entire, acute at the base and slightly prolonged into the petiole, bearing a pair of elongated glands on the prolongation beneath, glabrous or subglabrate on both surfaces; midrib slender, prominulent but flattened beneath; secondaries very slender, delicate, 5--7 pairs, usually hardly at all prominulent on either surface or very slightly prominulent on older leaves, arcuate-ascending; vein and veinlet reticulation very delicate, rather sparse, mostly rather obscure, prominulent only on older leaves; racemes axillary and terminal, greatly elongate, 17--30 cm. long or longer, 1--2 cm. wide during anthesis, mostly simple, nutant, the terminal ones often compound with a pair of branches at the top of the peduncle and as long as the central one, rather loosely many-flowered; peduncles and rachis slender, brown, glabrate or very sparsely and minutely puberulent, the former 2.5--6.5 cm. long; pedicels filiform, 1--3 mm. long, glabrate; bracts absent; bractlets linear, few, to 5 mm. long; prophylla linear-setaceous, 1--1.7 mm. long; calyx tubular-campanulate, glabrous except for the pubescent rim, the rim truncate, apiculate at the termination of the 5 ribs; corolla hypocrateriform, varying from light-lilac or lilac to blue, purple, or rose, sometimes mauve or light-violet, sometimes described as pale-lavender with deeper purple streaks on the lower lobes or with 3 dark-violet stripes on the 2 upper or outer lobes, its tube about twice as long as the calyx, about 6 mm. in length, externally glabrous, cano-villous in the throat, the lobes obovate, somewhat unequal, about 4 mm. long, reticulate-venose, ciliolate-margined, about 2 mm. wide at the base and 3 mm. wide at the apex; stamens 4, inserted slightly below the mouth of the corolla-tube, subincluded; fruit orange when ripe.

The type of this species was collected by Hans von Türckheim (*no. 295* -- or *7922* according to Smith's re-numbering) at Cubilquitz, at an altitude of 350 meters, Alta Verapaz, Guatemala, in March [not February, as stated on the Smith labels], 1901, and is deposited in the United States National Herbarium at Washington. Its broadly winged branches and branchlets, square stems, elongate racemes, and mostly membranous leaf-blades distinguish this species very well. Its closest relative is the common *C. affine* D. Don, with which it has sometimes been confused in herbaria. It has also been misidentified as *C. donnell-smithii* Greenm. by herbarium workers.

Some sheets of *Galeotti 1764* bear the number "764" -- the "1" probably having been omitted through error in copying when the labels were prepared. Wood of *Skutch 2021* is preserved in the wood collection of the Chicago Natural History Museum.

The species has been collected on ridges, in forests, in cornfields and coffee plantations, on hilltops, and in chaparral by the sea, at altitudes of from 20 to 1560 meters, blooming from March to May and in November and December, fruiting in May and June. Hinton reports that the cortex of the branches and twigs is often eaten by a boring insect, making a beautifully artistic pattern. He describes his *no. 15852* as "an herb 1.5 m. tall." His *no. 13739* is the fruit from the same tree of which *no. 13738* is flowering material. In all, 68 herbarium specimens, including the types of all the names involved, and 5 mounted photographs have been examined.

Citations: MEXICO: Chiapas: *Matuda 2522* (F--1003306, Mh, Mi, Mi, N, N, N), *18484* (N). Guerrero: *Hinton 14082* (N, N); *Langlassé 927* (Cb, Cb, Cb, G, K, N, W--386282). Michoacán: *Hinton 12631* (N, N), *13738* (Au, N, N, N, N), *13739* (Au, N, N, N), *15852* (W--1978317); *M. E. Jones 152* (W--236863). Oaxaca: *Galeotti 764 bis* (F--195946), *1764*, in part (Ca--168057, Cb, Cb, F--

195945, G, N, P, P, P, P, V, W--572964). Vera Cruz: Galeotti 1764, in part (L). GUATEMALA: Alta Verapaz: Steyermark 45695 (N, N); Türckheim 7922 [II.295] (A--isotype, B--isotype, B--isotype, B--photo of type, C--isotype, E--119059--isotype, G--isotype, K--isotype, K--isotype, K--photo of type, Me--isotype, Mu--3971--isotype, N--photo of type, S--photo of type, W--398402--isotype, W--1323218--isotype, W--1323219--type, Z--photo of type). Amatitlan: Bequaert 30 (F--699381, G, G, N). Quezaltenango: Skutch 2021 (F--933479, N, N). BRITISH HONDURAS: Schipp S.627 (F--733672, N).

CITHAREXYLUM PUNCTATUM Greenm., Field Columb. Mus. Publ. Bot. 2: 189. 1907.

Synonymy: Citharexylum puncatum Greenm., Field Columb. Mus. Publ. Bot. 2: 189, sphalm. 1907.

Literature: Greenm., Field Columb. Mus. Publ. Bot. 2: 189. 1907; Prain, Ind. Kew. Suppl. 4: 49. 1913; Herzog, Meded. Rijks Herb. Leid. 29: 46. 1916; Moldenke, Geogr. Distrib. Avicenn. 23 & 28. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34, 40, & 88. 1942; Moldenke, Lilloa 8: 415. 1942; Moldenke, Alph. List Cit. 1: 29, 301, 304, & 325 (1946), 2: 331, 420, 436, 447, 535, & 628 (1948), 3: 705, 883, 884, & 968 (1949), and 4: 1010, 1024, 1052, 1057, 1112, & 1120. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 72, 96, & 179. 1949.

Dwarf gnarled shrub, to 2 m. tall; branches and branchlets medium-slender, obtusely tetragonal or subterete, light-brown, woody, roughened, obscurely puberulent or subglabrate; twigs slender, numerous, minutely brownish-puberulent, more or less tetragonal, brown; nodes not noticeably annulate; principal internodes abbreviated, 0.6--2 cm. long;leaf-scars borne on relatively stout, corky, ascending sterigmata 1--3 mm. long; leaves numerous, decussate-opposite; petioles slender, 2--4 mm. long or subobsolete, glabrous; leaf-blades subcoriaceous, uniformly bright-green on both surfaces, shiny on both surfaces or only beneath, elliptic, 7--25 mm. long, 5--13 mm. wide, mostly acute at the apex, sparsely serrate with antrorse teeth toward the apex or subentire, mostly somewhat revolute along the margins, usually with 1 or 2 small glandular disks near the base beneath, glabrous but densely punctate on both surfaces, especially above where the punctae are deeply impressed; midrib slender, prominulent beneath; secondaries 3 or 4 pairs, short, indiscernible above, very slightly prominulent beneath; vein and veinlet reticulation indiscernible above, obscure or indiscernible beneath; racemes axillary and terminal, 1--6-flowered, the axillary ones usually 1- or 2-flowered and opposite; peduncles and rachis obsolete or very short, minutely puberulent; pedicels obsolete or to 1 mm. long, minutely puberulent; bracts and bractlets none; prophylla setaceous, minute; flowers 7--8 mm. long during anthesis; calyx tubular-campanulate, 3--4 mm. long, 5-angled in cross-section, glabrous except for the ciliolate rim, the rim sinuately 5-toothed; corolla subhypocrateriform, white or yellowish-white, 5--6 mm. long, externally glabrous, the tube pubescent in the upper third within and at the throat, the lobes oblong, about 1/3 as long as the tube; stamens 5, equal, included: filaments adnate to the corolla-tube; style glabrous; ovary glabrous; fruiting-pedicels incrassate, to 2 mm. long; fruiting-calyx indurated, cupuliform, to 4 mm. long and 6 mm. wide, glabrous, shiny, its rim deeply 5-lobed, the lobes acute at the apex; fruit drupaceous, oblong or suboblong, 10—12 mm. long, about 10 mm. wide, fleshy, glabrous, very shiny, black or purplish black when dry, 2-sulcate in drying; pyrenes oblong, about 7 mm. long, deeply concave on the ventral or inner surface, conspicuously corrugated or somewhat irregularly furrowed longitudinally on the dorsal surface.

The type of this very distinct species was collected by Miguel Bang (no. 1917) somewhere in Bolivia and is deposited in the Gray Herbarium at Harvard University. No locality or date of collection are given on the label of the type collection. The species has been found by collectors in thickets in the subalpine zone and in rocky crevices. Brooke found it "on lower and steeper slopes covered with forest, the rest pasture, cultivated at intervals, with good flora of flowering plants and ferns, from 12,000 feet up in constant cloud or rain in summer, lifting occasionally." It has been found at altitudes of 3350 to 3830 meters, blooming in January, April, May, and July, and fruiting in January. The deeply impressed punctae, especially on the upper surface of the leaf-blades, are quite characteristic; still it has been confused in herbaria with C. ilicifolium H.B.K., to which it is obviously related, but from which it differs in its smaller, entirely glabrous, punctate, non-spinose leaves. It has also been confused with Citharexylon cyanocarpum Hook. & Arn. [=Rhaphithamnus spinosus (A. L. Juss.) Moldenke]. In all, 71 herbarium specimens, including the types of all the names involved, and 3 mounted photographs have been examined.

Citations: PERU: Puno: Weberbauer 935 (B, Cb). BOLIVIA: Cochabamba: Brooke 5986 (N); Cardenas 4659 (W—2027194); Kuntze s.n. [Tunari] (N); Steinbach 9798 (F—634443, N). El Beni: Herzog 2273 (B, Cb, Le, N, S, V—1584). La Paz: Mandon 532 (B, Bm, Cb, F—686481, G, K, L, N, N, P, P, P, S, V—166939, V, X); H. H. Rusby 30 (J, N), 2058 (B, C, C, D, E—119107, Ed, G, L, Pa, V—982, X); Troll 1381 (B, B); O. E. White 183 (G, J, N, W—1232163). Department undetermined: M. Bang 1917 (B—isotype, B—photo of type, Bm—isotype, C—isotype, C—isotype, Cb—isotype, D—isotype, E—119106—isotype, Ed—isotype, F—77895—isotype, F—159086—isotype, G—type, K—isotype, K—photo of type, L—isotype, Mi—isotype, Mu—1844—isotype, N—photo of type, Pa—isotype, S—photo of type, V—1094—isotype, Vu—isotype, W—325793—isotype, W—1323211—isotype, X—isotype, Z—photo of type).

FOUR NOMENCLATURAL CHANGES OF WOODY PLANTS

Elbert L. Little, Jr.

These nomenclatural changes of woody plants follow a check of host names compiled from numerous sources in the manuscript, "Foreign Infectious Tree Diseases--Damage They Do; Their Potential Menace to Forests of Other Regions," by Perley Spaulding. The two new combinations and two new names are needed for that forthcoming Agricultural Handbook of the United States Department of Agriculture.

ACACIA PARVIFLORA Little, nom. nov.
Acacia micrantha Benth., Linn. Soc. London Trans. 30: 526. 1875. Non *A. micrantha* Desv. in Ham., Prodr. Pl. Ind. Occ. 60. 1825.
Senegalia micrantha (Benth.) Britton & Rose, No. Amer. Fl. 23: 115. 1928.

This species is a spiny shrub or small tree of Tamaulipas and San Luis Potosí in northern Mexico, first collected by Berlandier and Ehrenberg.

According to Bentham (Linn. Soc. London Trans. 30: 598. 1875), *A. micrantha* Desv. was altered to *A. microcantha* Desv. (Jour. de Botanique Appl. 3: 69. 1814). However, the latter name was published first. At present, *A. micrantha* Desv. is treated as a synonym of *Pithecellobium mangense* (Jacq.) Macbr. (*Chloroleucon mangense* (Jacq.) Britton & Rose).

ZANTHOXYLUM MELANORACHIS (Hoyle) Little, comb. nov.
Fagara melanorachis Hoyle, Kew Bull. 1933: 174. 1933.

Fagara L. has been accepted by some authors as a segregate from *Zanthoxylum* L. However, according to Fosberg (Taxon 7: 94-96. 1958) and Rickett (Taxon 7: 190. 1958), *Fagara* L., *nomen conservandum*, is to be rejected as a synonym of *Zanthoxylum* L. As the generic nomenclature is confused, it seems best to retain the conservative usage of *Zanthoxylum* L. in the broad sense. This species is from Nigeria.

BANISTERIOPSIS CAMPESTRIS (A. Juss.) Little, comb. nov.
Banisteria campestris A. Juss. in St. Hil., Fl. Bras. Mer. 3: 36, t. 168. 1832.

Heteropteris H. B. K. has been conserved over *Banisteria* L., *nom. rejic.*, and *Banisteriopsis* C. B. Robinson is a commonly accepted segregate. This species is a shrub widely distributed in Brazil.

FRAXINUS CHAMPIONII Little, nom. nov.

Fraxinus retusa Champ. in Benth., Hook. Jour. Bot. Kew Misc. 4: 330. 1852. Non *F. retusa* Raf., Alsogr. Amer. 34. 1838; "Fr. L. retusa Raf."; *nom. alt.*

Fraxinus retusa Raf. and *Leptalix retusa* Raf. were published simultaneously as alternative names with Latin diagnosis for a tree of New Jersey. The segregate genus *Leptalix* Raf. (New Fl. No. Amer. 3: 93. 1836 [1838]; Alsogr. Amer. 31. 1838) was not adopted by later authors. *Fraxinus retusa* Raf. was listed in Index Kewensis and was cited also by Merrill (Index Rafinesquianus 190. 1949). Lingelsheim (in Engler, Pflanzenreich 72 Heft (IV. 243): 59. 1920) listed this among the incompletely described names. Under Article 33 of the International Code of Botanical Nomenclature (1956), alternative names published before 1953 are valid.

Fraxinus retusa Champ. (Sect. *Ornus*, Subsect. *Euornus*) is a small to medium-sized tree native in central and eastern China, Hong Kong, and Formosa. According to Rehder (Man. Cult. Trees Shrubs ed. 2, 768. 1940), a variety from central China was introduced into cultivation in 1900. This species is scarcely of sufficient economic or other importance for its name to merit retention under any proposals to conserve or reject specific names or epithets. As there are no apparent synonyms, the species is here renamed for its British collector and describer, Colonel John George Champion (1815-54). His extensive collections at Hong Kong including numerous new species were reported as Florula Hongkongensis by George Bentham in Hooker's Journal of Botany and Kew Garden Miscellany, volumes 3-7, 1851-55.

Bentham (Flora Hongkongensis 8*-9*. 1861) noted that Colonel (then Captain) Champion was stationed with the British 95th Regiment at Hong Kong from 1847 to 1850. During these three years he devoted his leisure time to the investigation of the flora of the island. Upon returning to England he brought a fine collection of between five and six hundred species of seed plants and ferns, many accompanied by memoranda, descriptions, and analytical sketches. He lost his life in the Crimean War.

Lingelsheim (in Engler, Pflanzenreich 72 Heft (IV. 243): 22-23. 1920) accepted besides the typical variety these two varieties: *F. retusa* Champ. var. *henryana* Oliver (Hook. Icon. Pl., ser. 3, 10: t. 1930. 1890) and var. *integra* Lingelsheim (Bot. Jahrb. 40: 213. 1907). However, as the minor differences were chiefly in leaf margin, perhaps the varieties need not be maintained. Isotypes of both varieties were examined at the National Herbarium of the United States National Museum.

Forest Service, United States Department of Agriculture,
Washington, D. C.

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